



City of Bismarck, North Dakota

Utility Cost of Service
& Rate Design Study:

*Stakeholder Meeting:
Phase II – Revenue
Requirements*

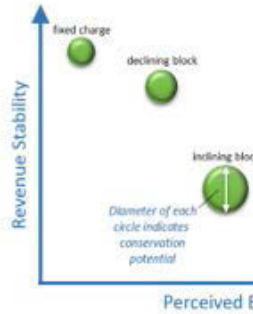
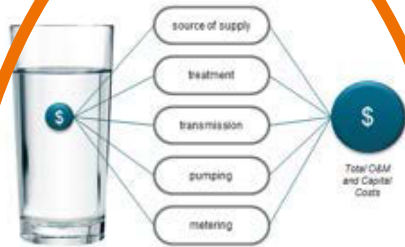
August 1, 2018

Big Picture: Just Completed First Step

- The review of strengths, weaknesses, and opportunities happened first (Phase I)
 - Public meetings on 5/7 and 6/11; Commission on 6/26
- **Detailed analytical work has commenced during the next phase of work (Phase II)**
- Once we are done, will prepare and present report, provide models, etc. (Phase III)

Phase II: General Task Sequence

Phase II Steps



Revenue Requirements

- Operating Costs
- Operating Costs
- Capital Costs
- Financial Policies
- Debt Coverage
- Reserves

Cost Allocation

- Evaluate Available Data
- Establish Classes
- Identify Methodology
- Compare Results to Current Revenue

Rate Design

- Evaluate Objectives
- Define Classes
- Identify Structures
- Set Parameters
- Customer Impacts

Cost Allocation

- Define Classes
- Set Objectives
- Trunkline Assessment
- Miscellaneous Fees
- Curb Stop Repair
- Back-Up Coverage
- Unannexed Surcharge

Rate Design

- Set Objectives

Active Stakeholder Participation

What we will cover for each utility

Start: Discuss source data and assumptions:

- Identification of current resources (reserves)
- Current customers stats, trends, and revenues
- Operating expenditure requirements
- Discussion of multi-year capital improvements

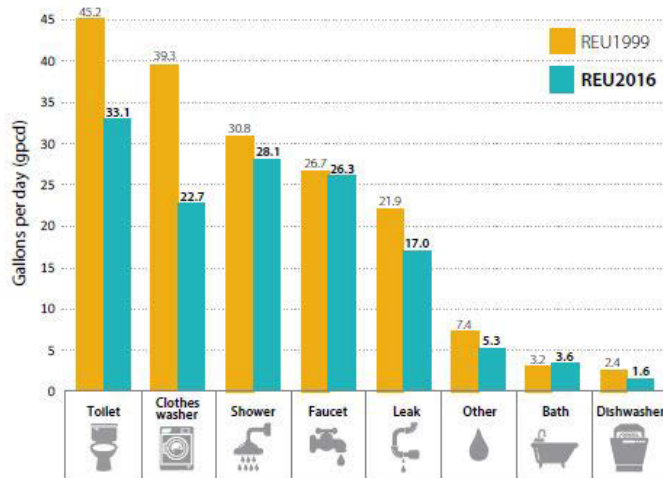
Finish: Review PRELIMINARY financial plans

Goal: Enhance understanding of resources and expenditure requirements, and receive input

Ask lots of questions & provide comments!

Things to keep in mind about utilities

Continued Reductions in Water Use



22%
DECREASE
PER HOUSEHOLD
DAILY WATER USE
1999 TO 2016

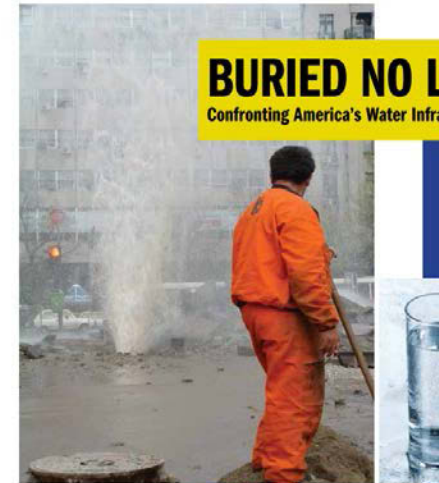
Affordability

Water & Sewer bills have increased at 3x the rate of inflation since 2008

■ Water/Sewer Bills

■ Income Growth

Infrastructure Reinvestment Needs



BURIED NO L
Confronting America's Water Infra



American Water Works
Association

The Authoritative Resource on Safe Water®

Water Utility System Overview



Water System

371

Miles of water lines

\$143M

Net asset value

11 MGD

Avg water production

31 Yrs

Remaining asset life

21K

Active accounts

\$56M

5-year CIP

Current Resources (Fund Balance)

Reserve Summary

Reserve Type	Amount		Description
Rate Stabilization	\$	1,207,494	Measure of volumetric revenue at risk
Emergency Capital	\$	1,033,095	Average replacement cost of critical asset
Emergency Capital Equipment	\$	100,000	Cost of replacing key piece of equipment
General Contingency	\$	400,294	5% of expenses (contingency & assessment volatility)
Liquidity	\$	987,025	45 days of operating expenses
Curb Stop Reserve	\$	437,459	
		<u>Amount</u>	<u>Months</u>
Reserve Required	\$	4,165,367	7
Current Reserve	\$	5,878,704	9

Utility also has \$5.4 million of restricted funds per bond covenants that can only be released once outstanding debt is retired.

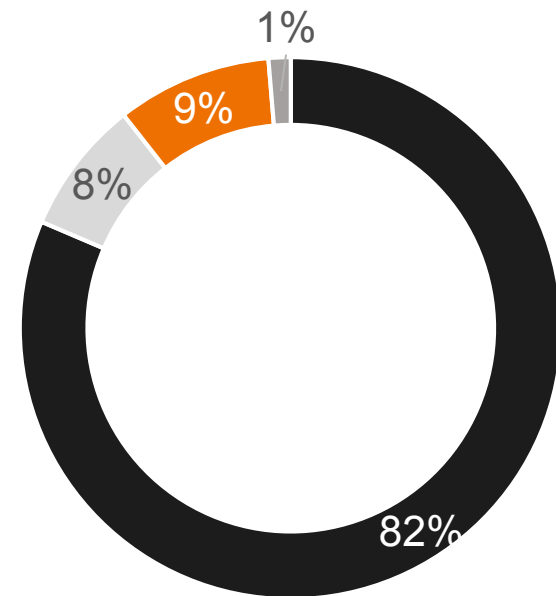
How Many Customers We Have

Meter	Residential	Multi-Family ⁽¹⁾	Commercial	Irrigation ⁽²⁾
5/8"	755	106	35	
3/4"	8,188	378	345	
1"	8,754	661	709	
1.5"	83	417	414	
2"	22	156	348	
3"	3	25	125	
4"	0	4	35	
8"	0	0	11	
8"	0	1	2	
10"	0	0	2	
Total	17,803	1,749	2,025	289

(1) About 15,400 multi-family dwelling units are served by these meters.

(2) Irrigation meters are presently not billed fixed charges by meter size.

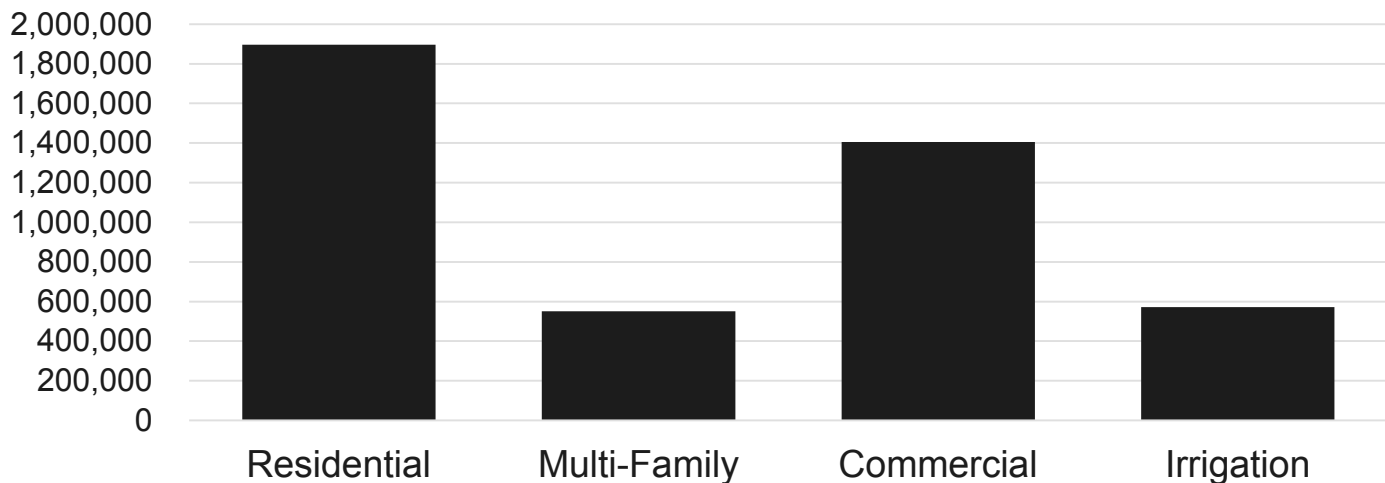
Connections by Customer Type



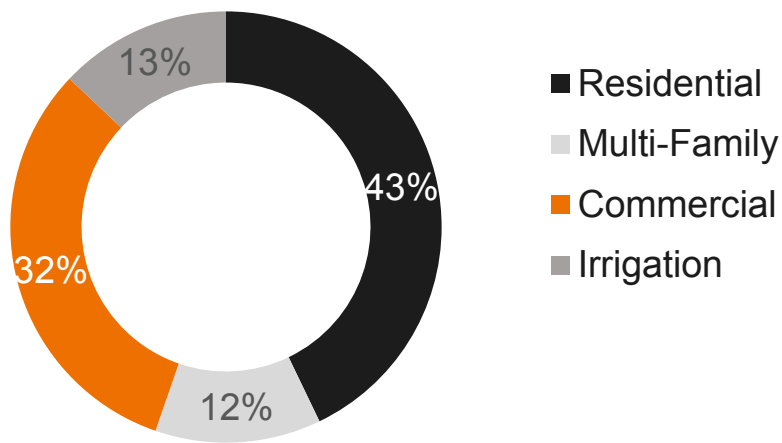
■ Residential ■ Multi-Family
■ Commercial ■ Irrigation

How Much Water We Use (Normal Year)

2016 Consumption by Customer Type (CCF)

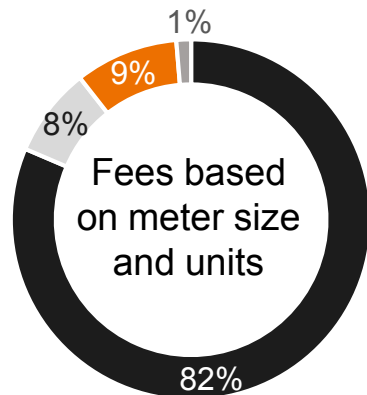


Volume by Customer Type



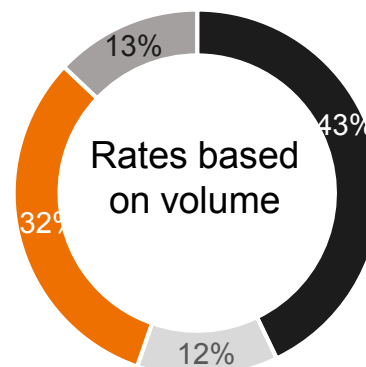
Revenue From Each Customer Type

Connections by Customer Type



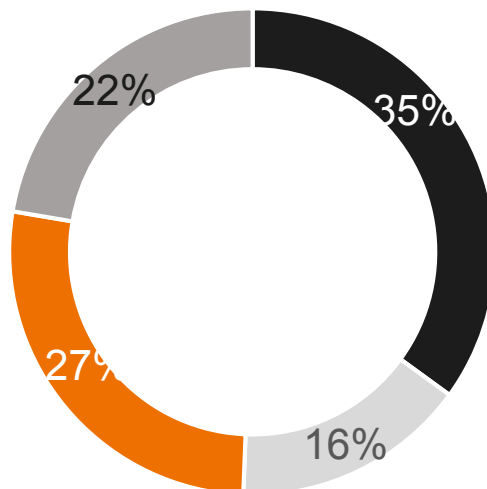
■ Residential ■ Multi-Family ■ Commercial ■ Irrigation

Volume by Customer Type



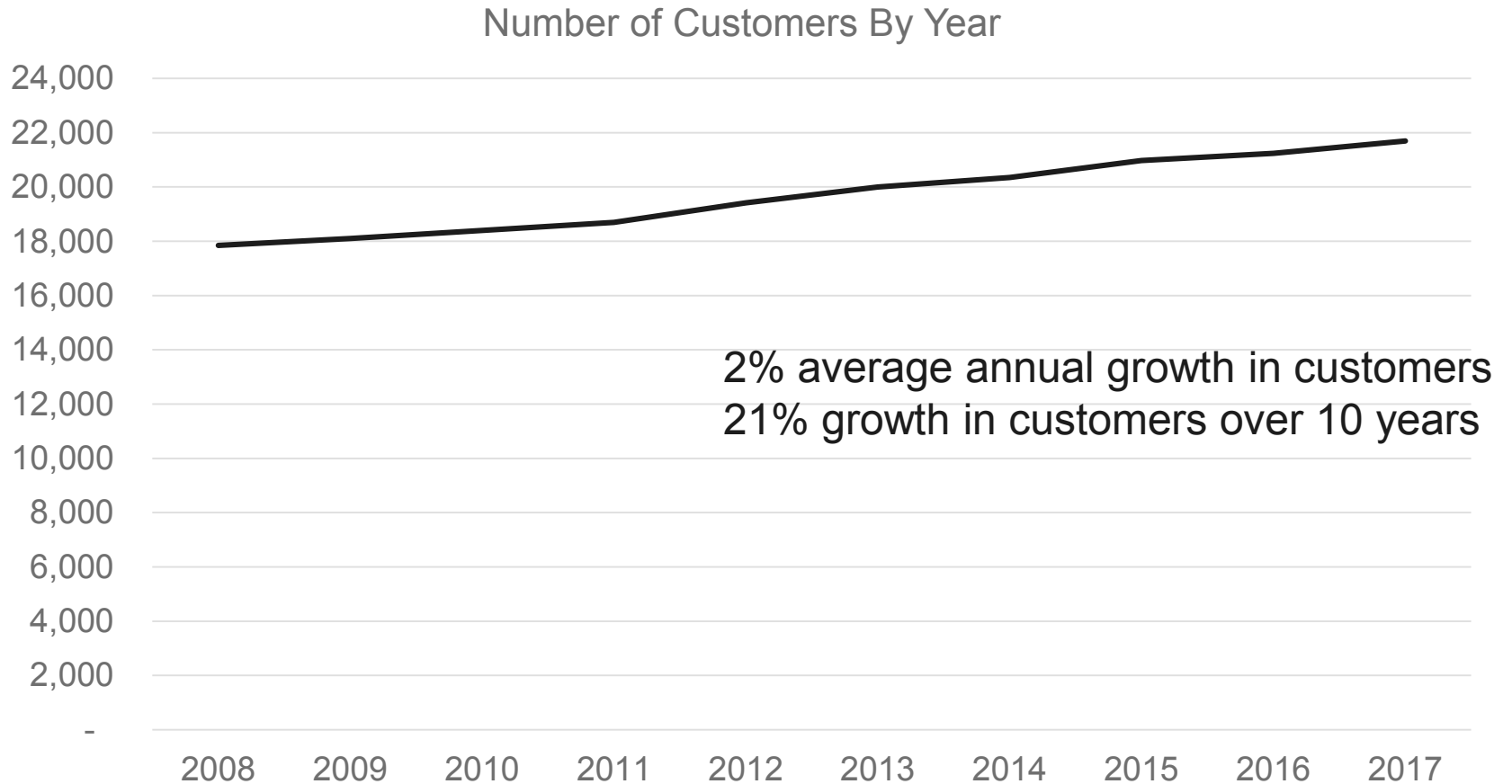
■ Residential ■ Multi-Family ■ Commercial ■ Irrigation

Projected 2018 Revenue by Customer Type

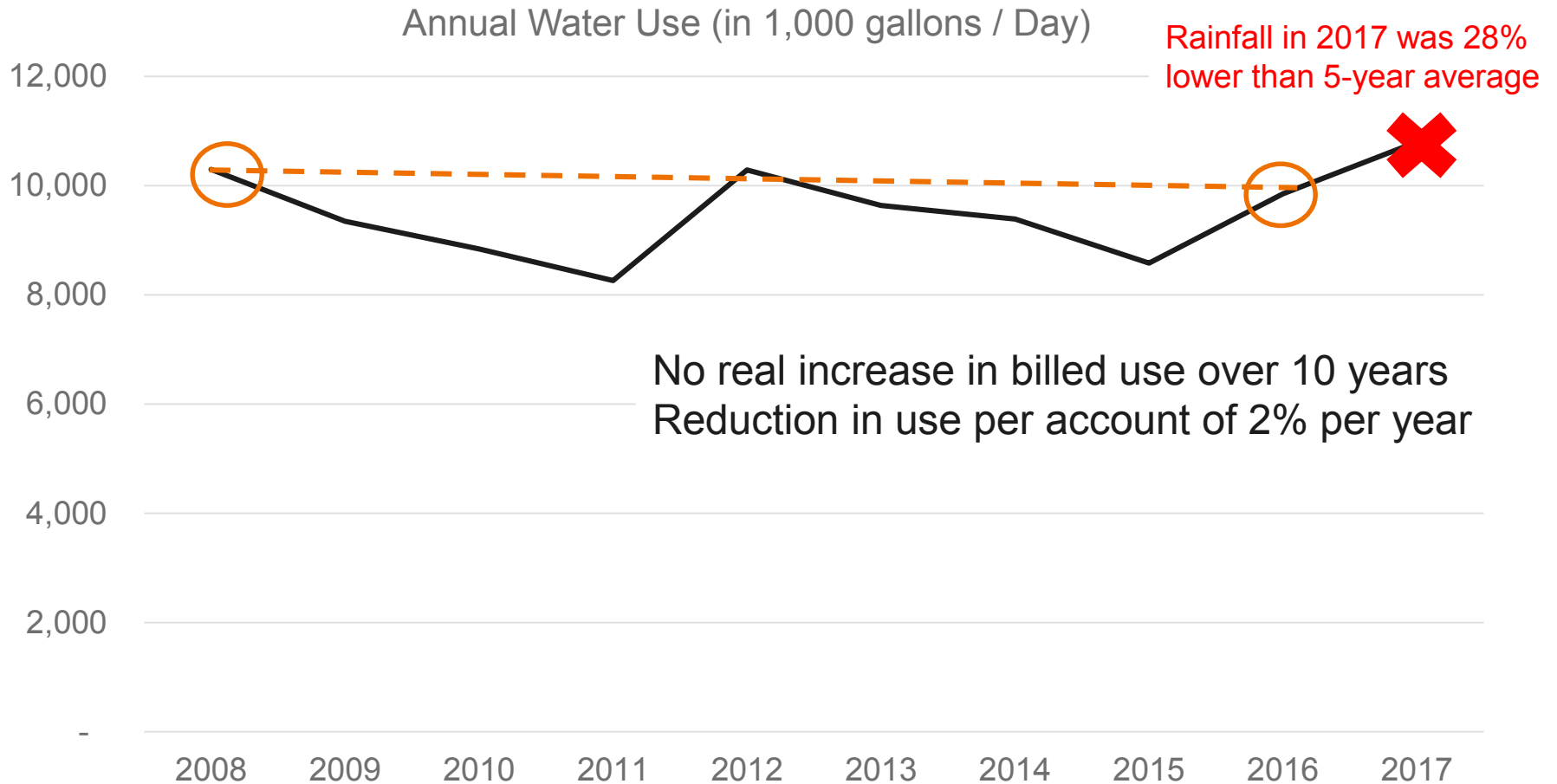


■ Residential
■ Multi-Family
■ Commercial
■ Irrigation

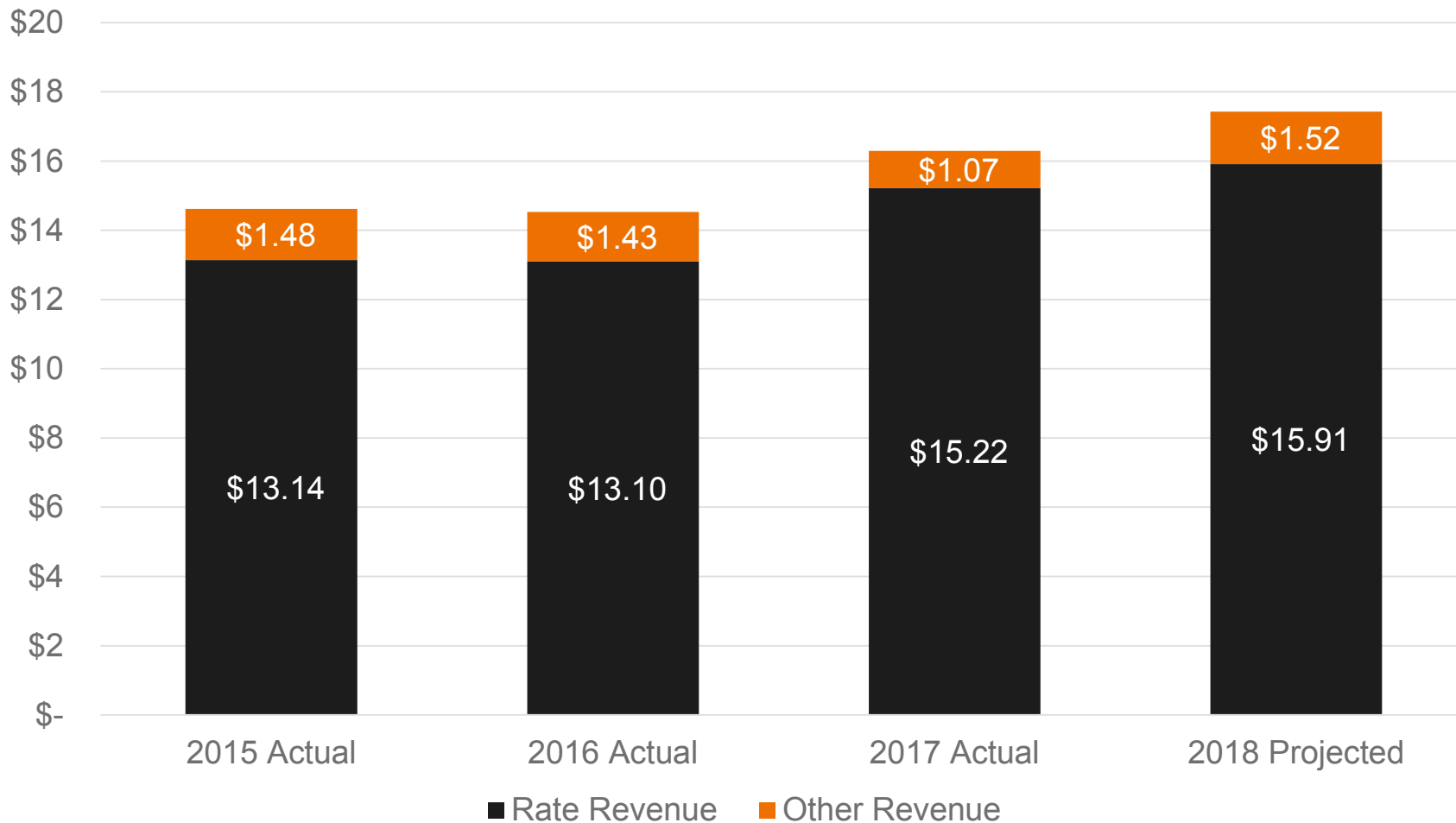
How Our Customer Base Has Grown



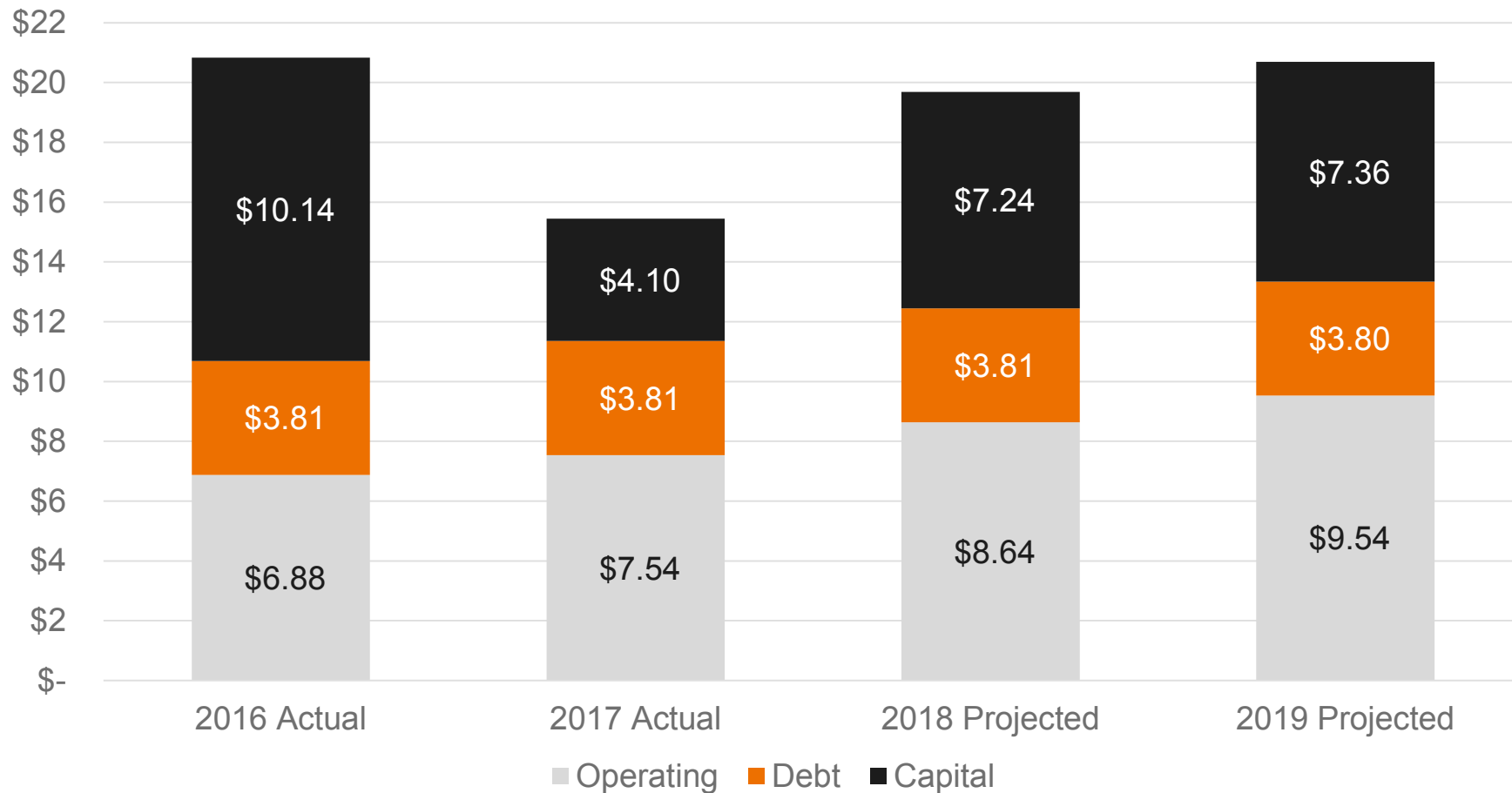
How Our Water Use Has Changed



Total Annual Revenue (\$ in Millions)

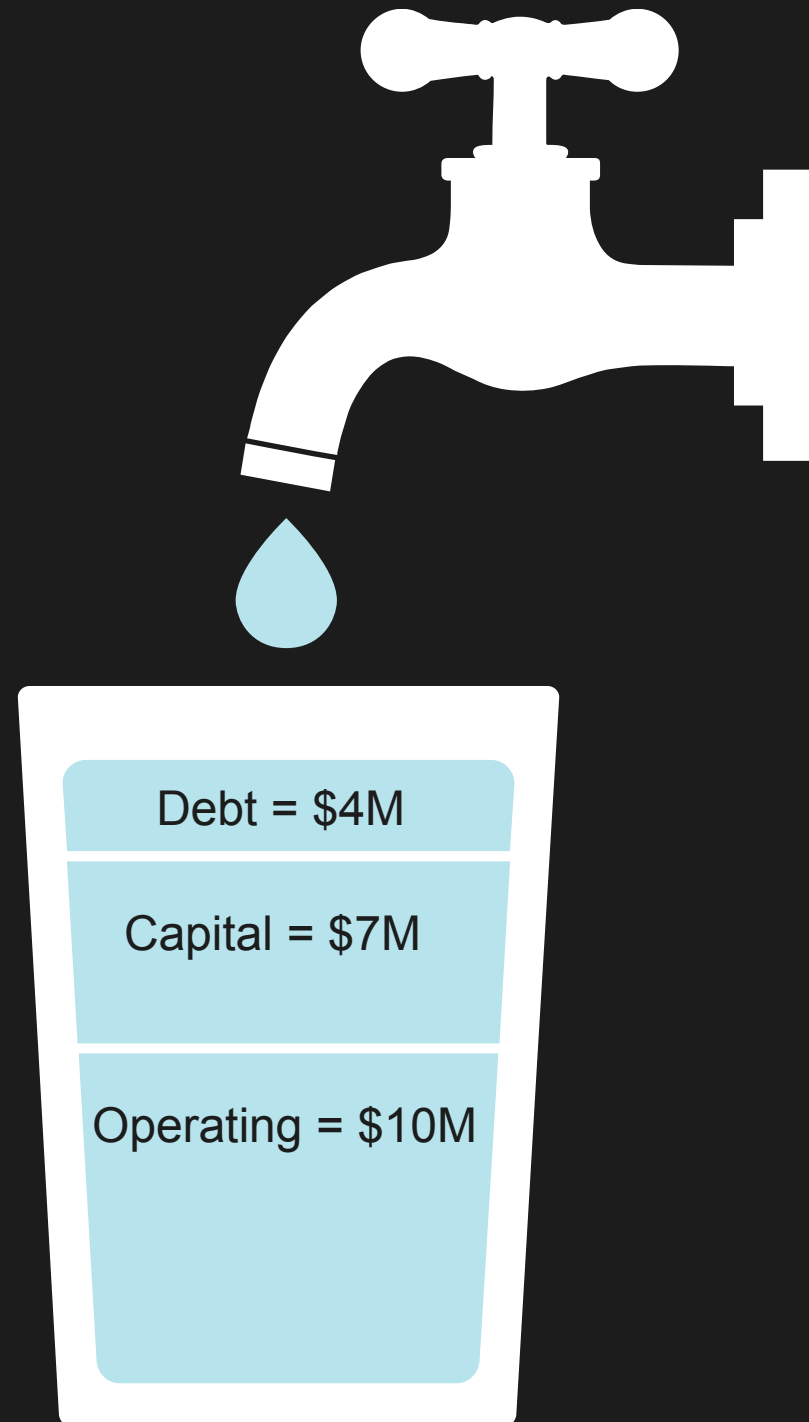


Total Annual Expenditures (\$ in Millions)

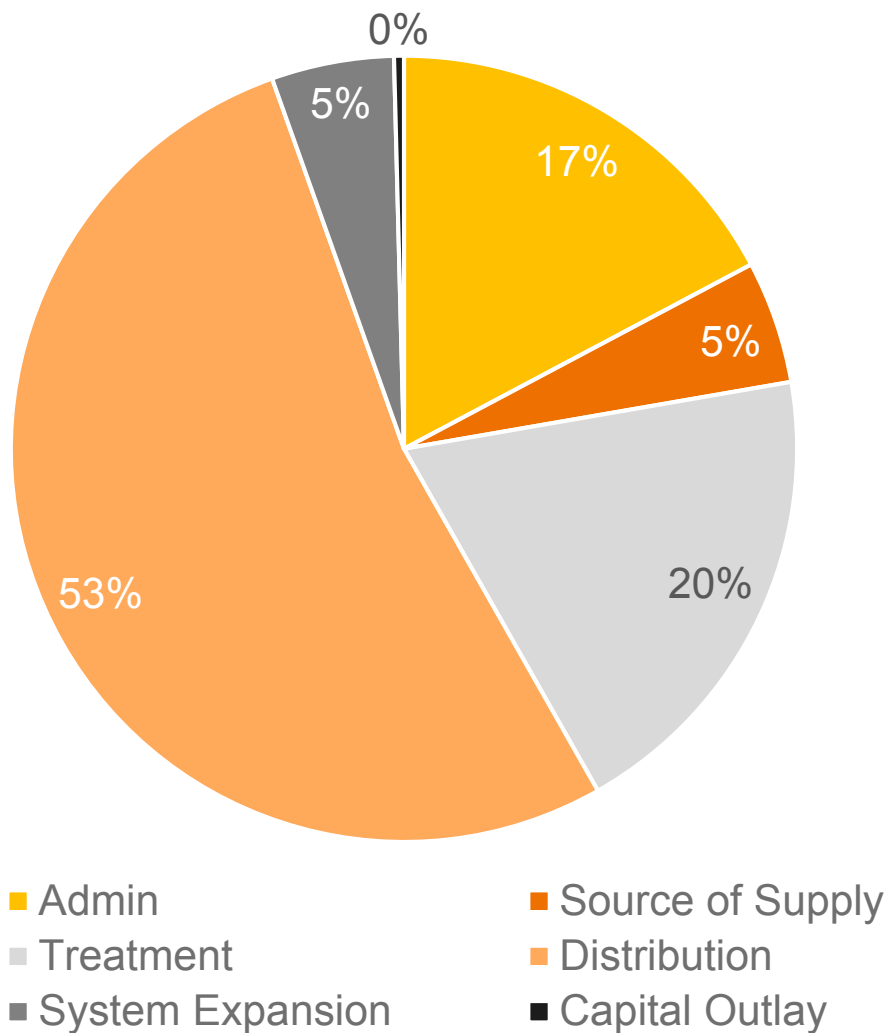


THE COST TO FILL A GLASS OF WATER

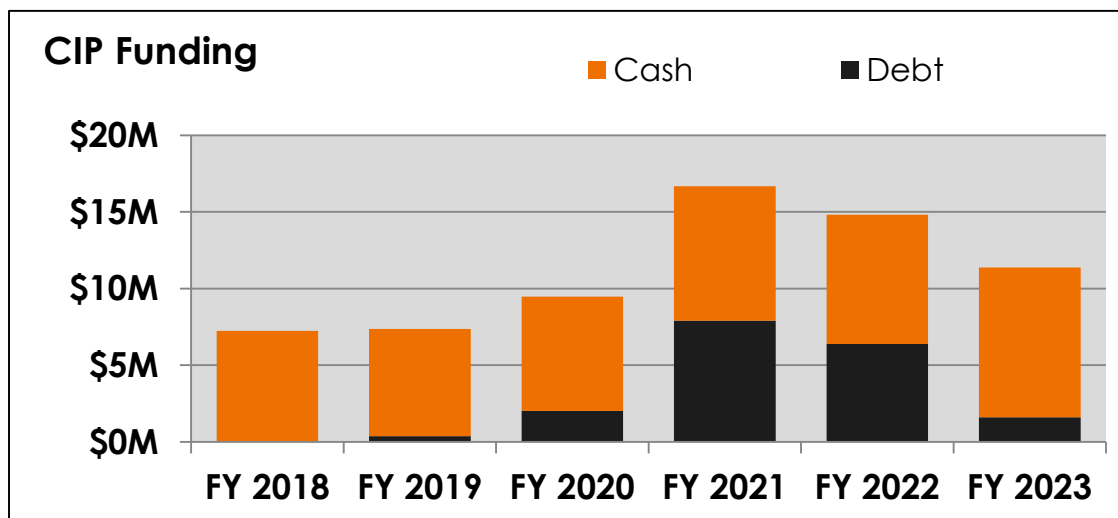
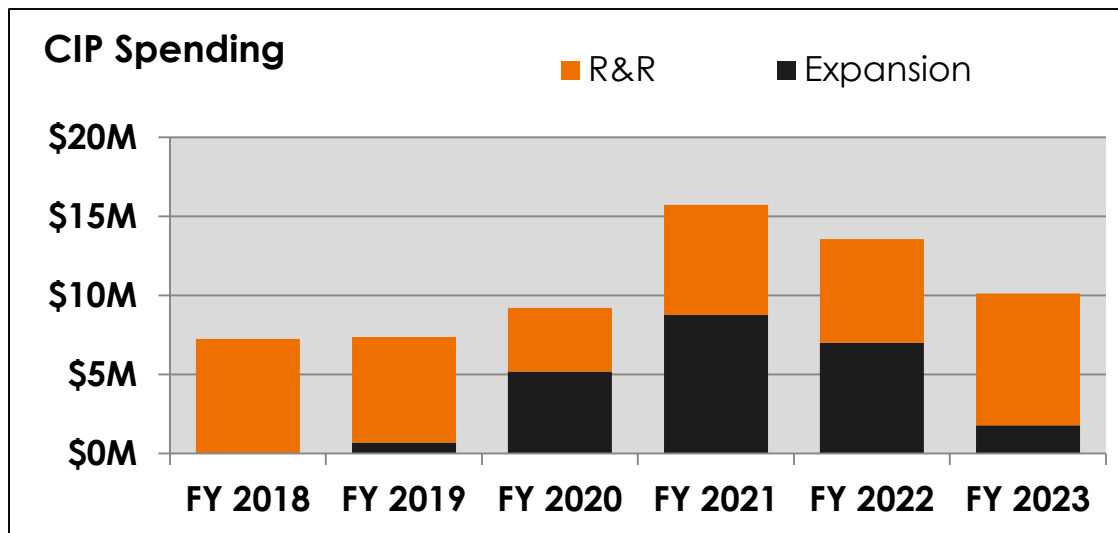
Represents current projections for FY 2019



10-Year Capital Spending Distribution



Current Capital Funding Sources





Water Status Quo Financial Summary

\$18M

2018 revenue estimate

\$21M

2019 expenditures

\$96M

10-year capital plan

-\$34M

Projected 2028 funding deficit



Scenario 1: Status Quo – Do Nothing

Water System

No future rate increases

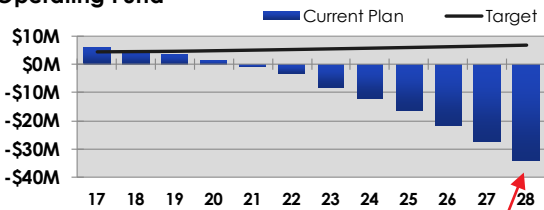
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Bismarck, ND

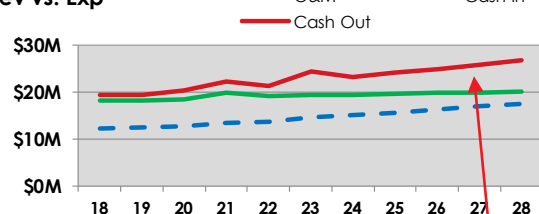


	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2022	FY 2027
Water Rate Plan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Curb Stop Rate Plan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
Senior-Lien DSC	2.64	2.62	2.49	2.34	2.37	2.13	2.01	1.90	1.78	1.67	1.56		
Average Bill (9 CCF)	\$31.65	\$31.65	\$31.65	\$31.65	\$31.65	\$31.65	\$31.65	\$31.65	\$31.65	\$31.65	\$31.65		
Change \$		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	Check	-

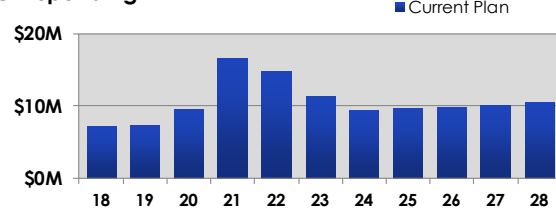
Operating Fund



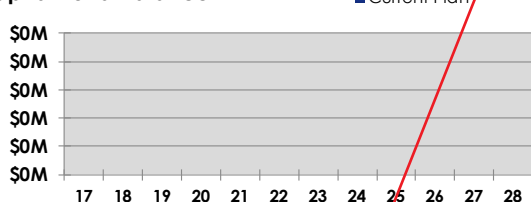
Rev vs. Exp



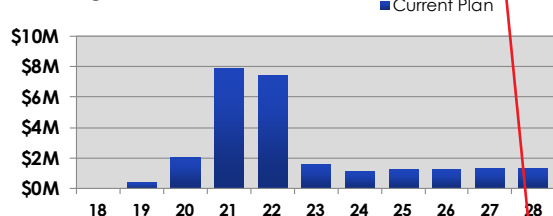
CIP Spending



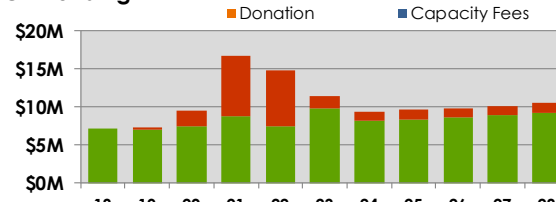
Capital Fund Balance



Borrowing



CIP Funding



Deficit of \$34M by 2028

Not sustainable



Scenario 2: "Just-in-Time" Adjustments

Water System

CALC LAST2
SAVE OVR2
CTRL

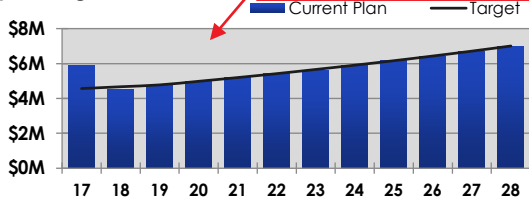
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12% rate increase in FY 2023

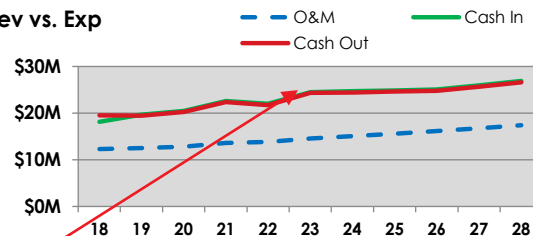


	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2022	FY 2027
Water Rate Plan	0.00%	8.91%	3.67%	2.81%	0.00%	12.46%	0.00%	0.00%	0.10%	3.20%	3.27%	16.00%	34.78%
Curb Stop Rate Plan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
Senior-Lien DSC	2.64	2.99	3.03	2.97	3.04	3.29	3.19	3.11	2.99	3.00	3.01		
Average Bill (9 CCF)	\$31.65	\$34.29	\$35.46	\$36.40	\$36.40	\$40.70	\$40.70	\$40.70	\$40.71	\$41.96	\$43.24		
Change \$		\$2.64	\$1.17	\$0.94	\$0.00	\$4.30	\$0.00	\$0.00	\$0.01	\$1.25	\$1.28	Check	0

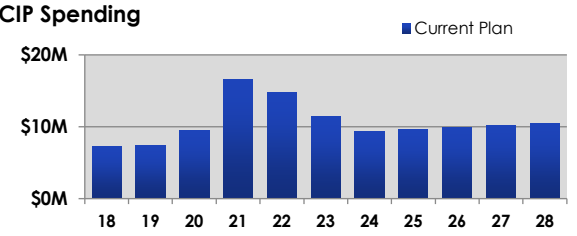
Operating Fund



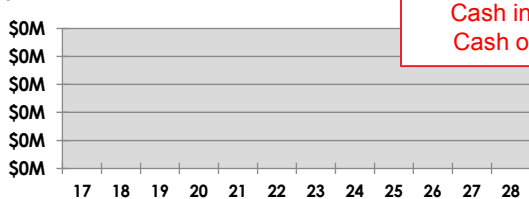
Rev vs. Exp



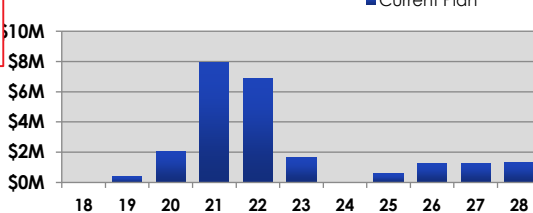
CIP Spending



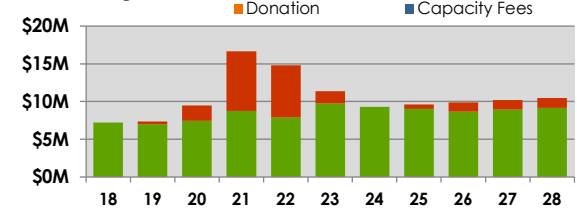
Capital Fund Balance



Borrowing



CIP Funding



Scenario 3: "Levelized" Adjustments

Water System

CALC LAST2
SAVE OVR2
CTRL

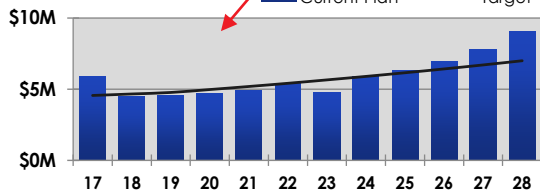
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Bismarck, ND

Level plan of rate increases
beyond FY 2019

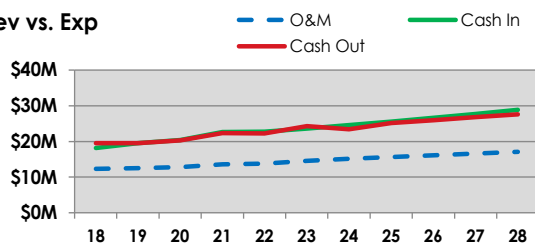


	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2022	FY 2027
Water Rate Plan	0.00%	8.00%	3.75%	3.75%	3.75%	3.75%	3.75%	3.75%	3.75%	3.75%	3.75%	20.52%	44.87%
Curb Stop Rate Plan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
Senior-Lien DSC	2.64	2.95	3.00	2.97	3.23	3.12	3.16	3.25	3.37	3.48	3.62		
Average Bill (9 CCF)	\$31.65	\$34.03	\$35.24	\$36.49	\$37.77	\$39.13	\$40.52	\$41.99	\$43.47	\$45.05	\$46.64		
Change \$		\$2.38	\$1.21	\$1.25	\$1.28	\$1.36	\$1.39	\$1.47	\$1.48	\$1.58	\$1.59	Check	-

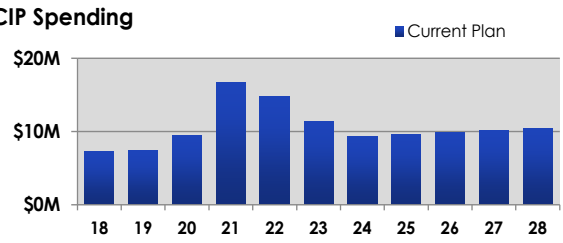
Operating Fund



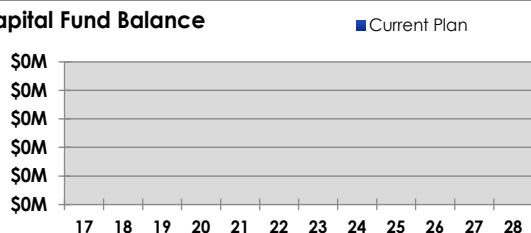
Rev vs. Exp



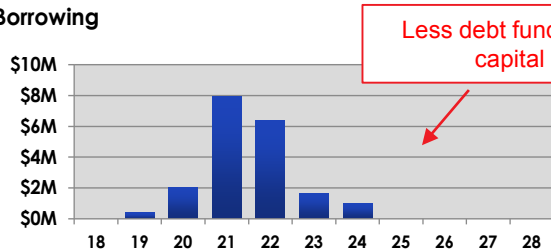
CIP Spending



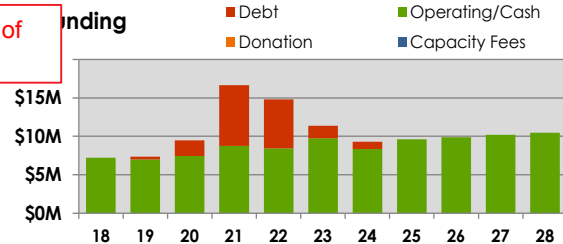
Capital Fund Balance



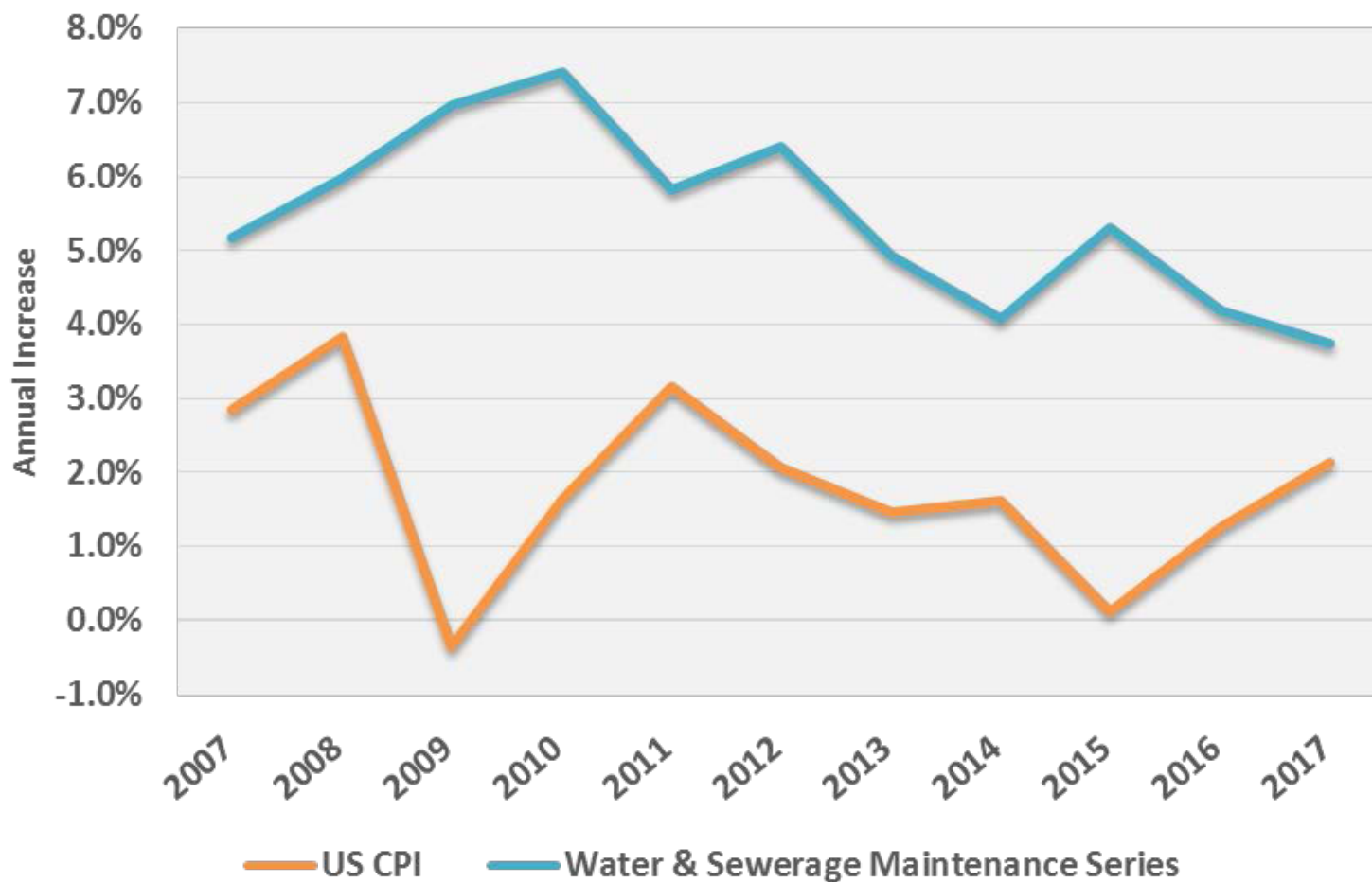
Borrowing



Funding



Overall CPI vs. Water/Sewerage CPI



Sewer Utility System Overview



Sewer System

313

Miles of sewer lines

\$83M

Net asset value

6 MGD

Avg. wastewater volume

29 Yrs

Remaining asset life

21K

Active accounts

\$52M

5-year CIP

Current Resources (Fund Balance)

Reserve Summary

Reserve Type			Description
Rate Stabilization	\$ 89,580		Measure of volumetric revenue at risk
Emergency Capital	\$ 1,267,195		Average replacement cost of critical sewer asset
Emergency Capital Equipment	\$ 200,000		Cost of replacing key piece of equipment
General Contingency	\$ 237,941		5% of expenses (contingency & assessment volatility)
Liquidity	\$ 586,703		45 days of operating expenses
Backup Coverage Reserve	\$ 182,094		Dedicated funds
	Amount	Months	
Reserve Required	\$ 2,563,513	7	
Current Reserve	\$ 6,090,901	15	
Available for Future Expenses	\$ 3,527,388		

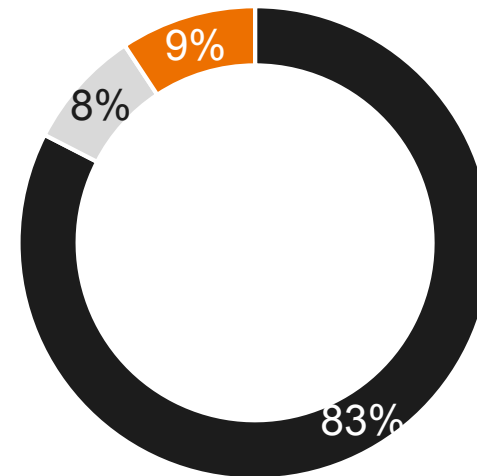
Utility also has \$5.8 million of restricted funds per bond covenants that can only be released once outstanding debt is retired.

How Many Customers We Have

Meter	Residential	Multi-Family ⁽¹⁾	Commercial
5/8"	754	106	35
3/4"	8,158	379	339
1"	8,720	662	693
1.5"	83	417	405
2"	22	156	345
3" & Up	3	42	179
N/A	61	0	9
Total	17,800	1,762	2,004

(1) About 15,200 multi-family dwelling units are served by these meters.

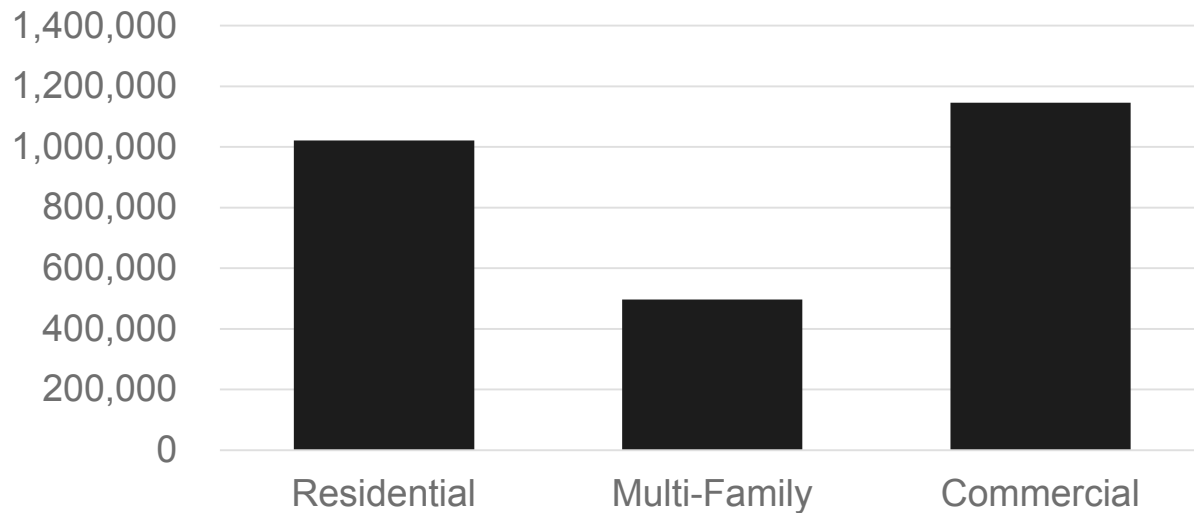
Connections by Customer Class



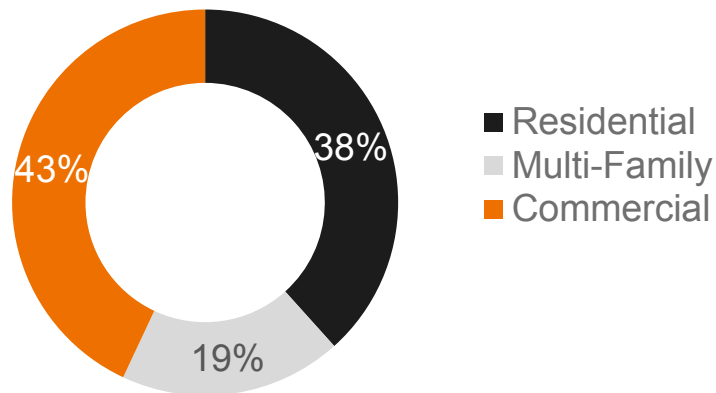
■ Residential ■ Multi-Family ■ Commercial

How Much Wastewater We Have

2016 Volume by Customer Type (CCF)

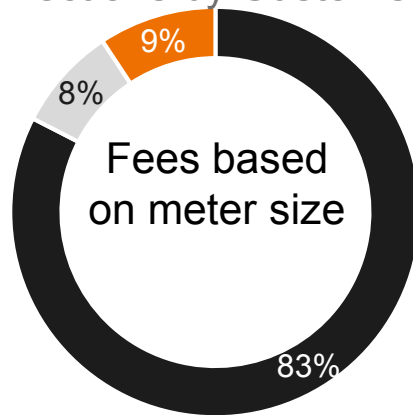


Volume by Customer Type



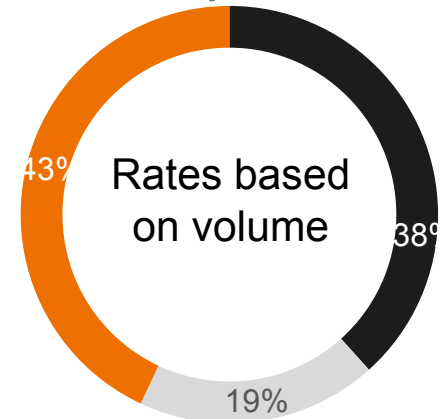
Revenue From Each Customer Type

Connections by Customer Type



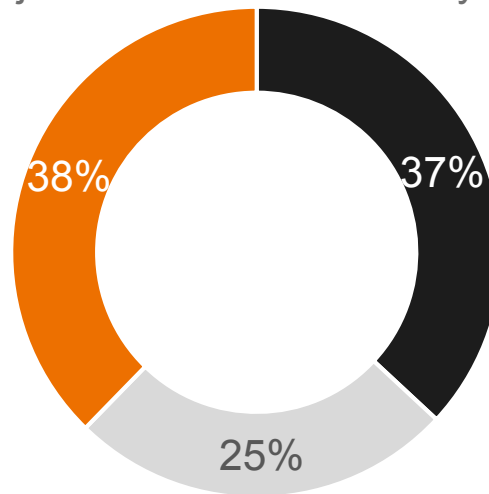
■ Residential ■ Multi-Family ■ Commercial

Volume by Customer Type



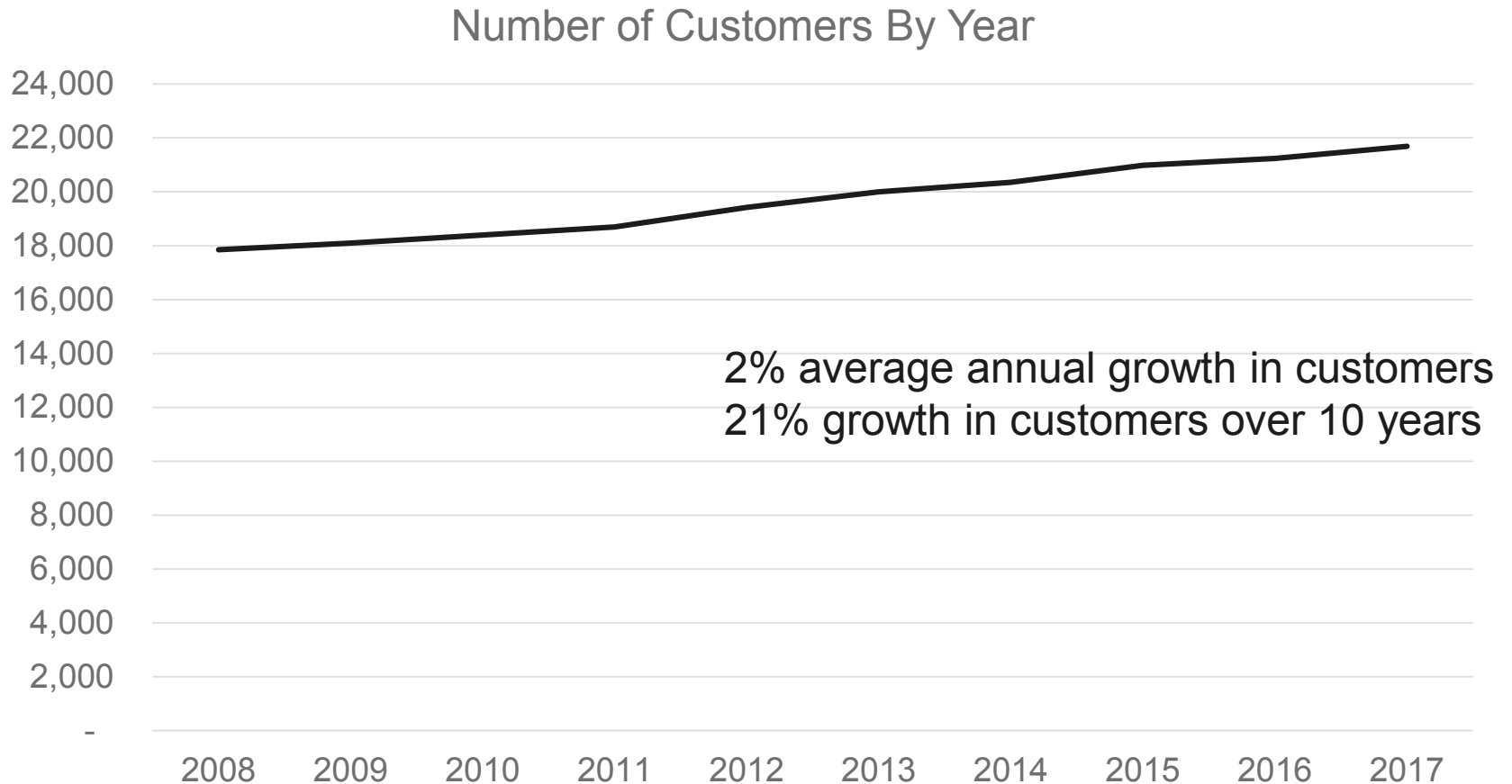
■ Residential ■ Multi-Family ■ Commercial

Projected 2018 Revenue by Customer Type

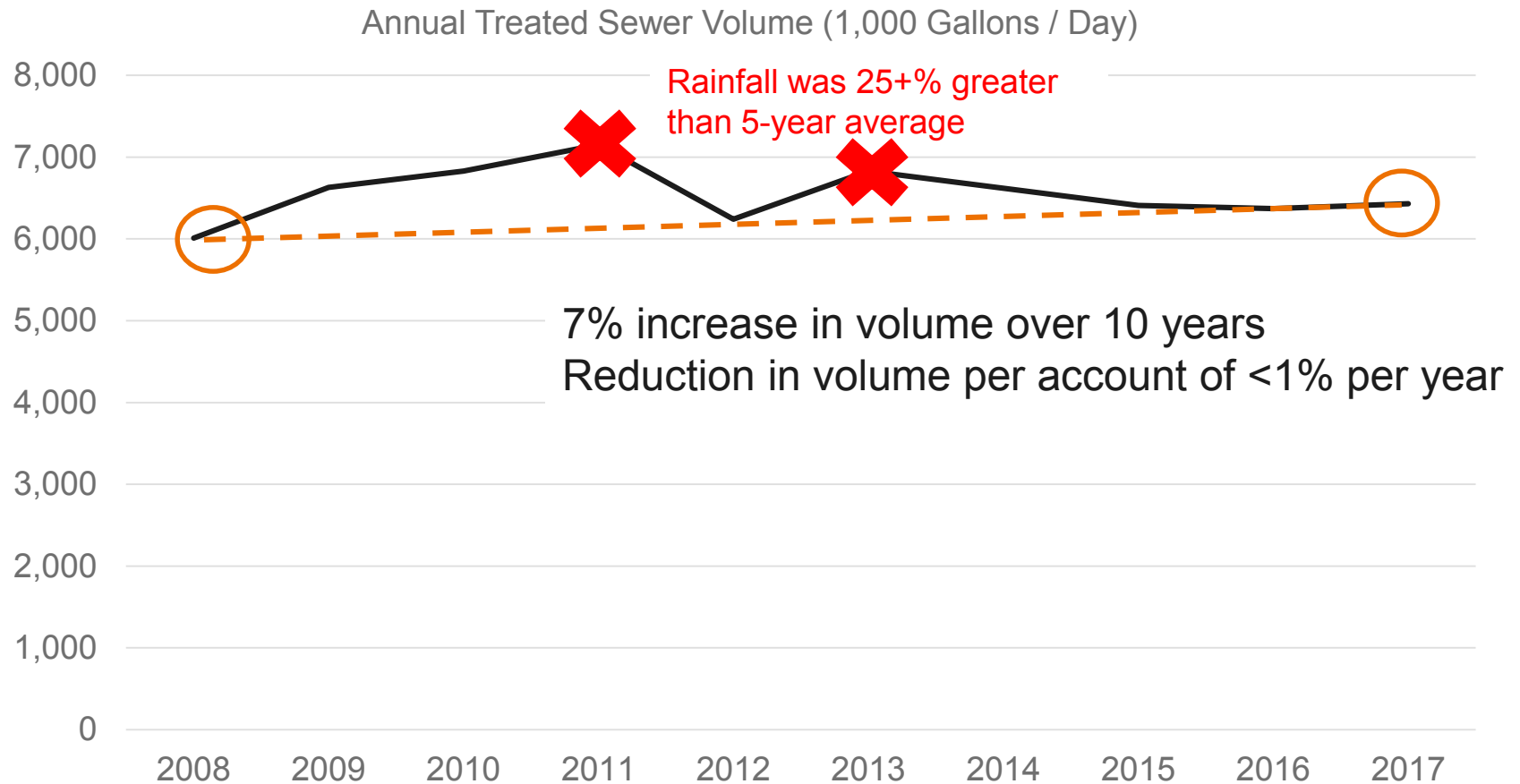


■ Residential
■ Multi-Family
■ Commercial

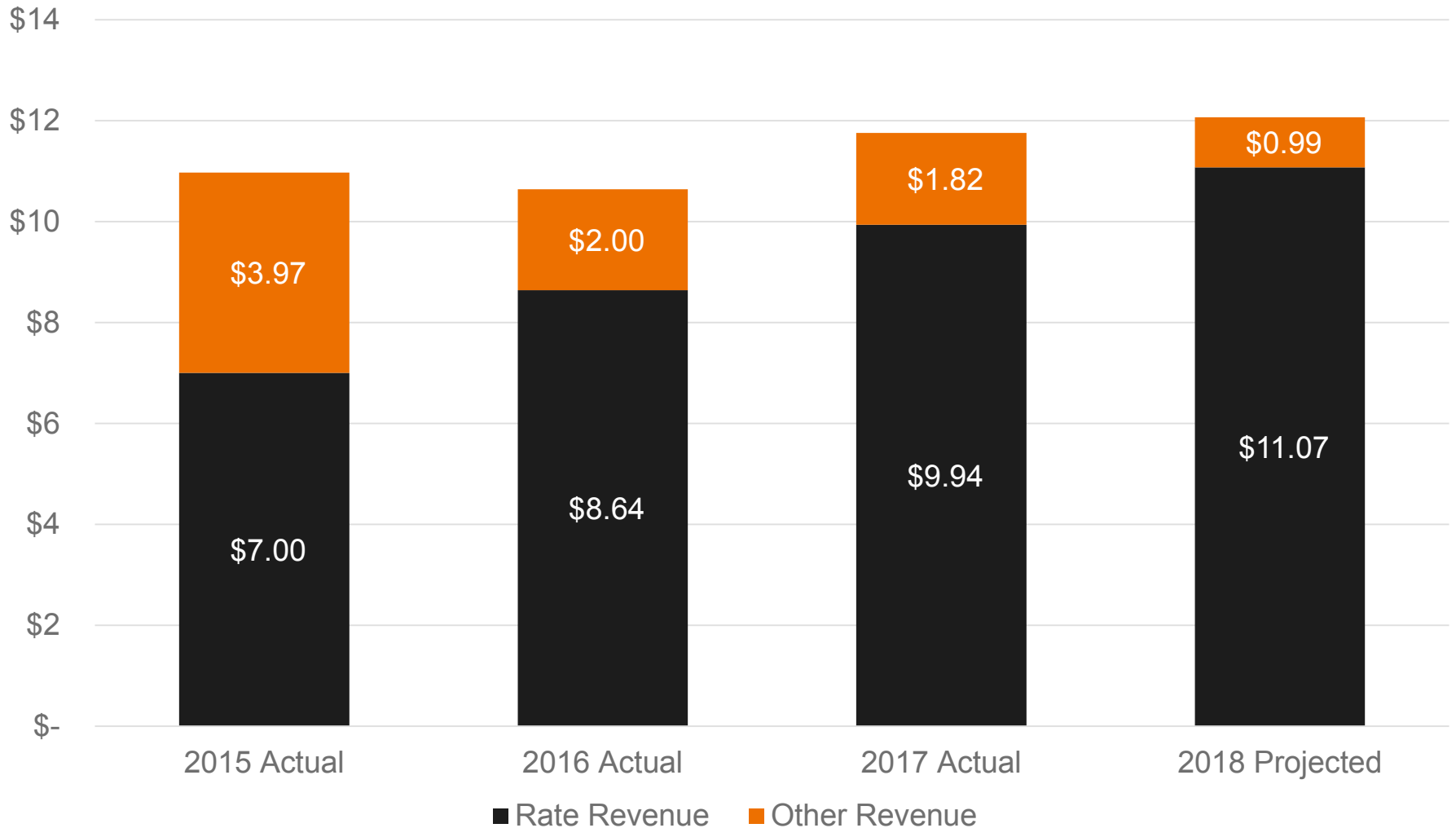
How Our Customer Base Has Grown



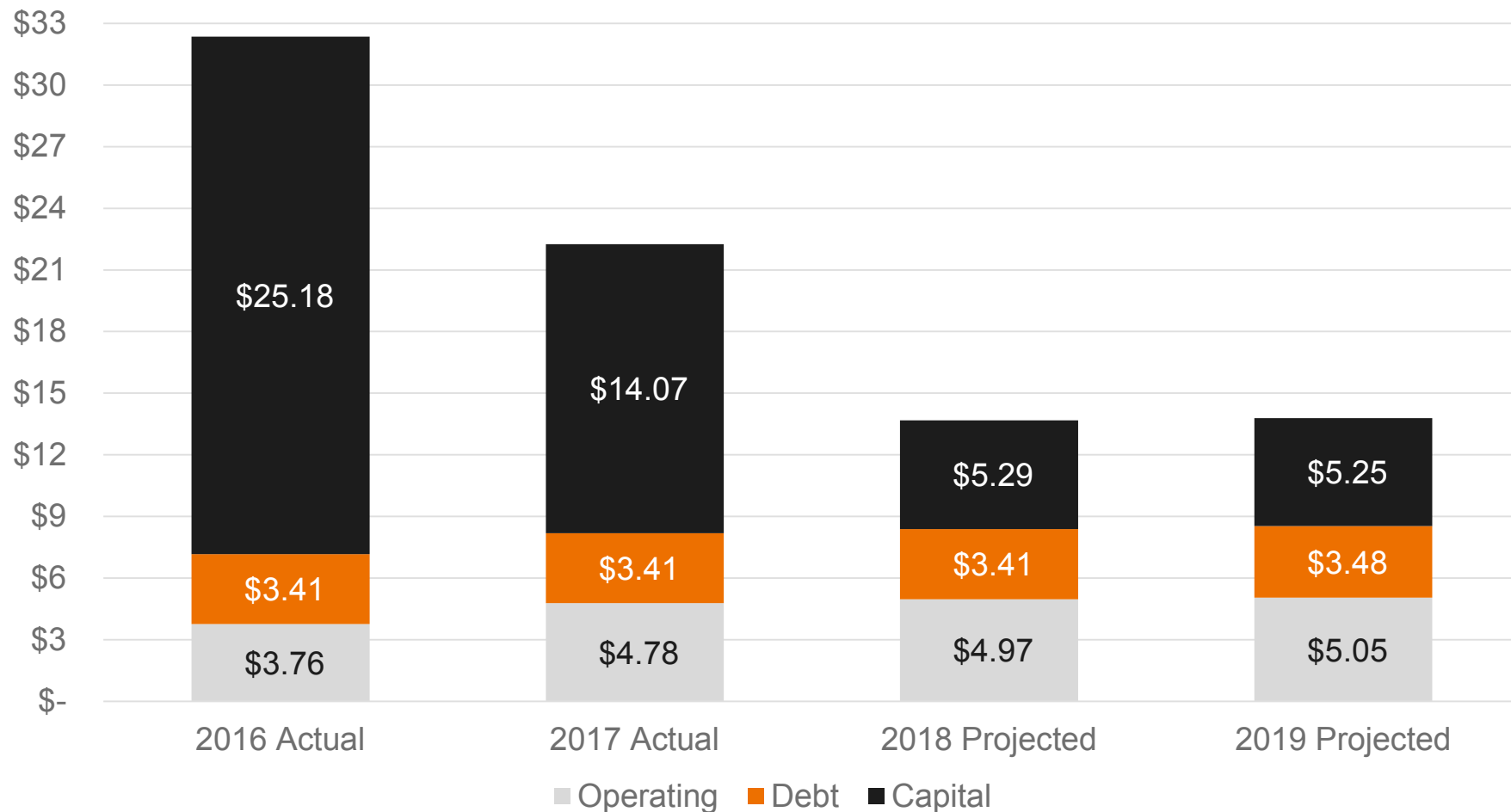
How Our Sewer Volume Has Changed



Total Annual Revenue (\$ in Millions)

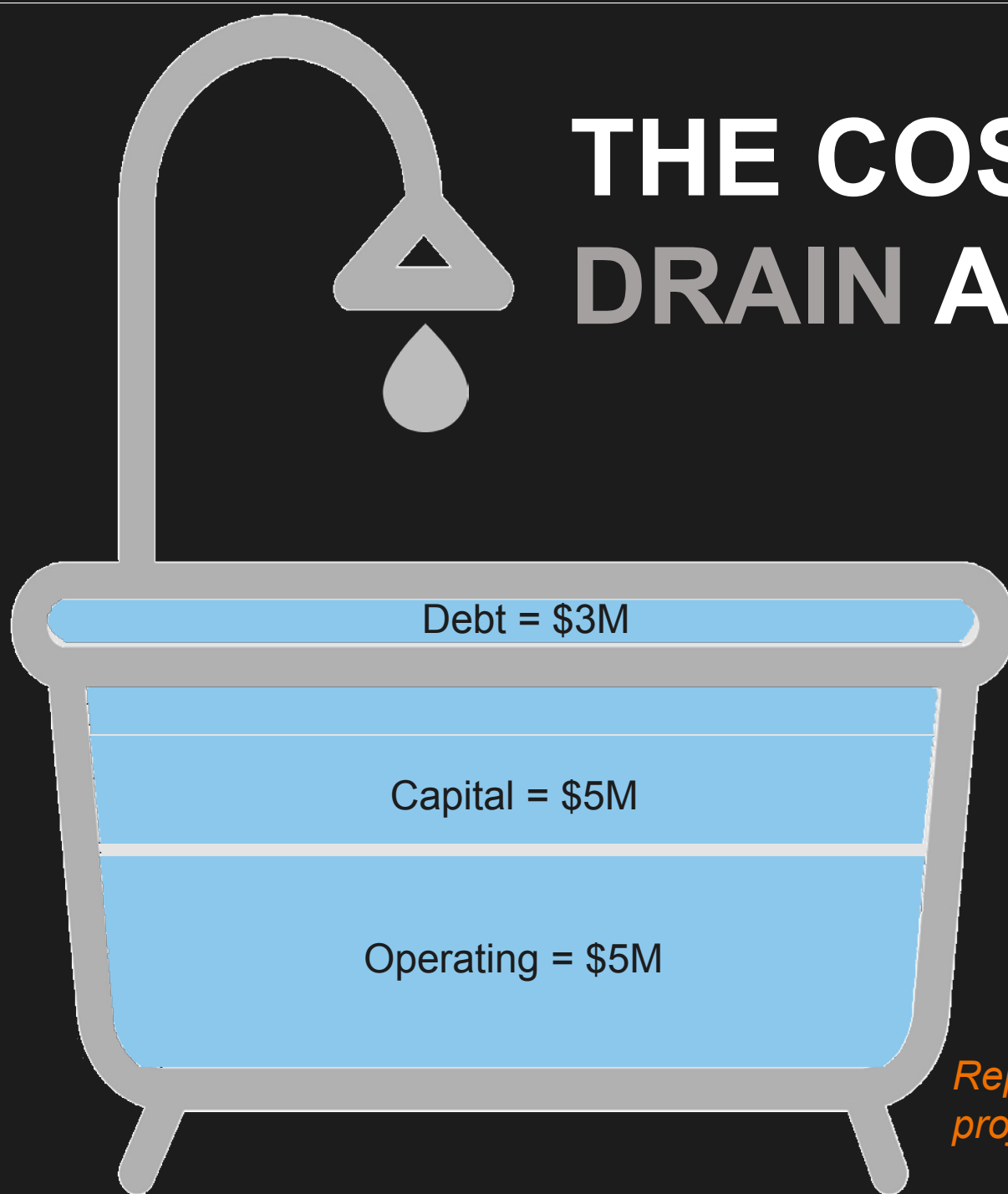


Total Annual Expenditures (\$ in Millions)



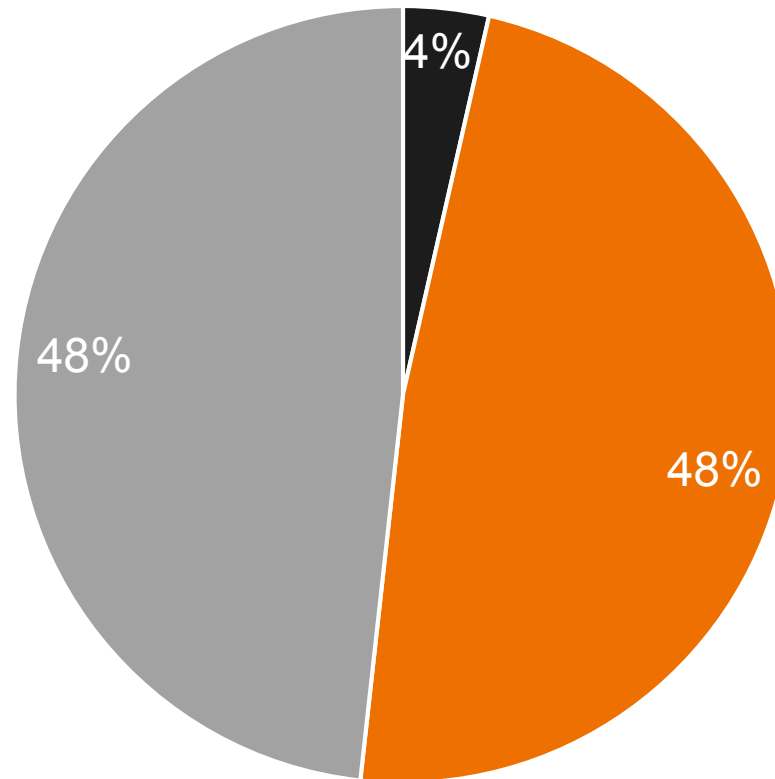


THE COST TO DRAIN A TUB



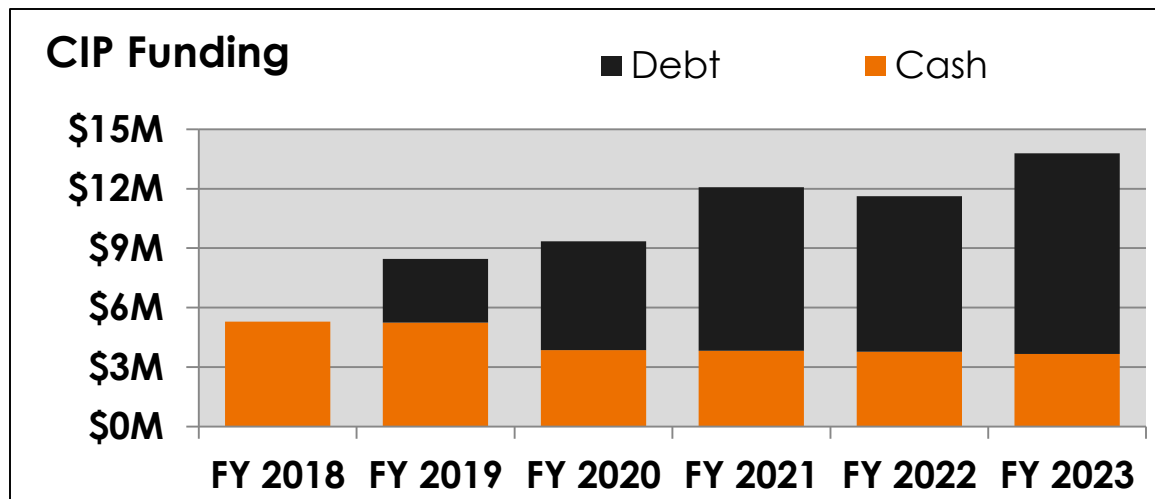
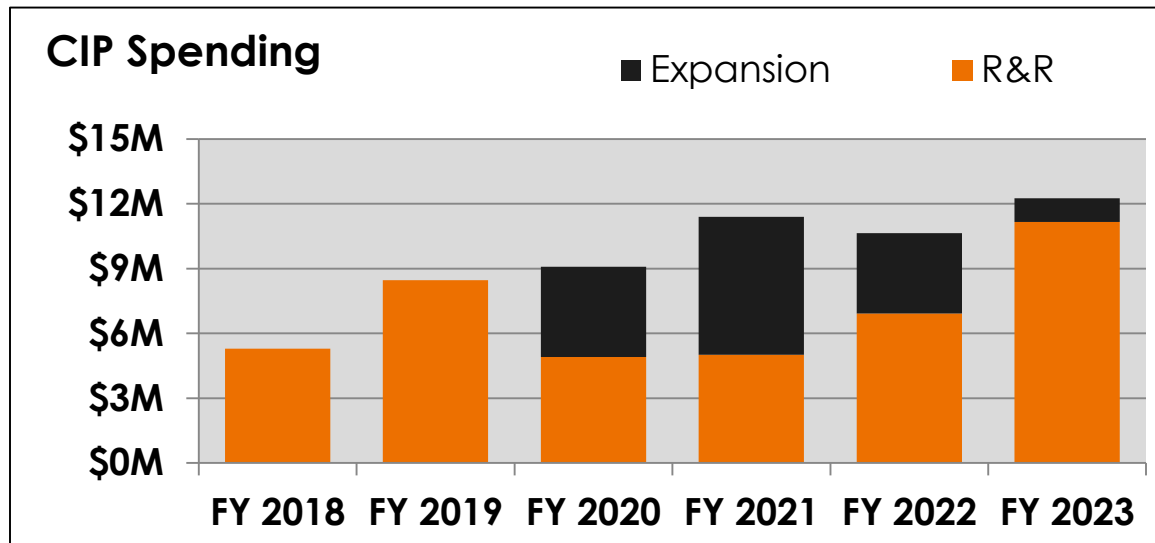
*Represents current
projections for FY 2019*

10-Year Capital Spending Distribution



■ Capital Outlay ■ Collection ■ Treatment

Current Capital Funding Sources





Sewer Status Quo Financial Summary

\$12M

2018 revenue estimate

\$13M

2019 expenditures

\$70M

10-year capital plan

-\$24M

Projected 2028 funding deficit



Scenario 1: Status Quo – Do Nothing

Sewer System

No future rate increases

Not Meeting Debt Service Coverage Requirement

CALC LAST2
SAVE OVR2
CTRL

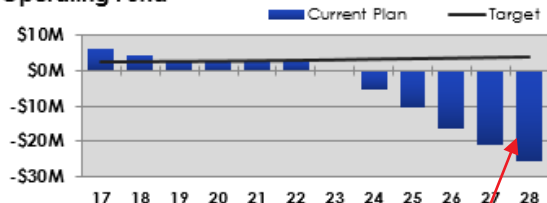
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Stantec

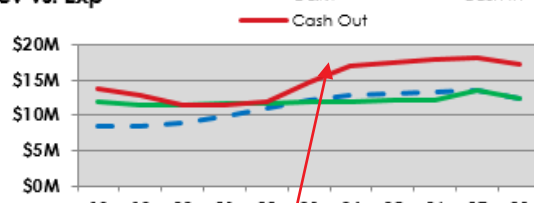
	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2022	FY 2027
Sewer Rate Plan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Backup Surcharge	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Senior-Lien DSC	1.93	1.86	1.68	1.42	1.19	1.00	0.90	0.88	0.86	0.84	1.02		
Avg Bill (9 CCF)	\$35.95	\$35.95	\$35.95	\$35.95	\$35.95	\$35.95	\$35.95	\$35.95	\$35.95	\$35.95	\$35.95		
Change \$		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		

Check -

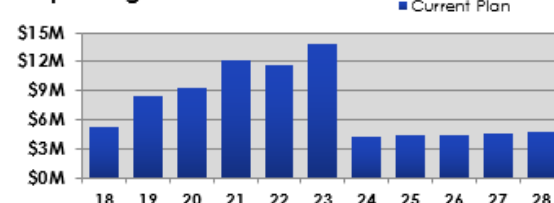
Operating Fund



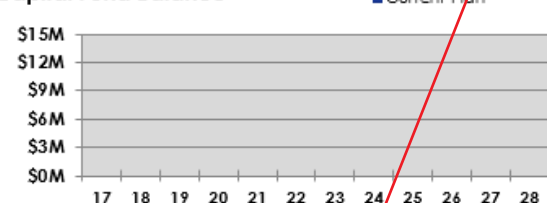
Rev vs. Exp



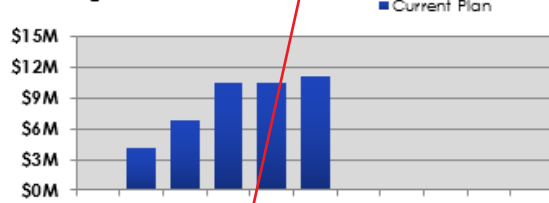
CIP Spending



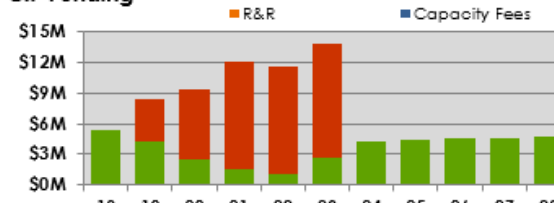
Capital Fund Balance



Borrowing



CIP Funding



Deficit of \$24M by 2028

Not Sustainable

Scenario 2: "Just-in-Time" Adjustments

Sewer System

CALC LAST2
SAVE OVR2
CTRL

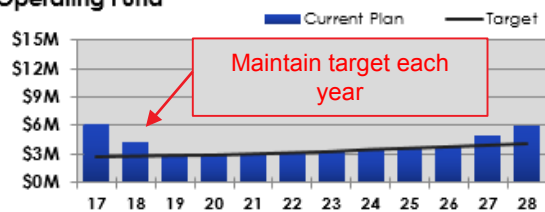
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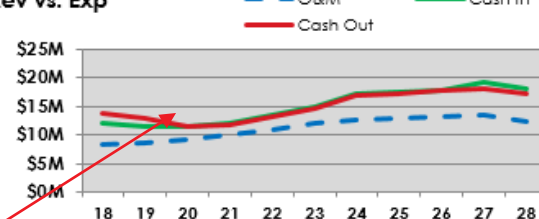
3 years of double digit rate increases

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2022	FY 2027
Sewer Rate Plan	0.00%	0.00%	0.00%	3.59%	10.42%	10.14%	15.01%	1.06%	1.26%	0.00%	0.00%	14.32%	48.49%
Backup Surcharge	0.00%	-33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
Senior-Lien DSC	1.93	1.85	1.67	1.50	1.50	1.50	1.71	1.73	1.75	1.73	2.16		
Avg Bill (9 CCF)	\$35.95	\$35.80	\$35.80	\$37.09	\$40.89	\$45.01	\$51.73	\$52.31	\$52.99	\$52.99	\$52.99		
Change \$		(\$0.15)	\$0.00	\$1.29	\$3.80	\$4.12	\$6.72	\$0.58	\$0.68	\$0.00	\$0.00	Check	-

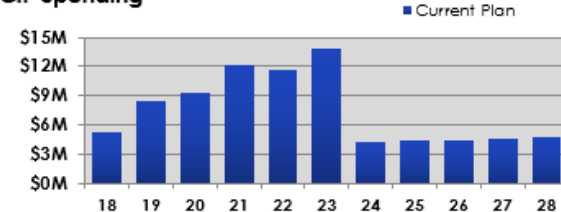
Operating Fund



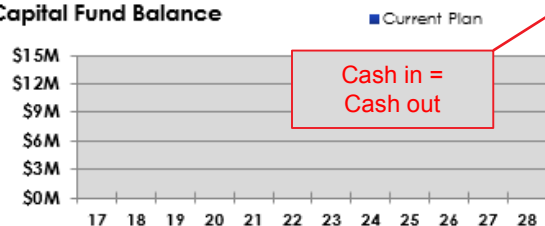
Rev vs. Exp



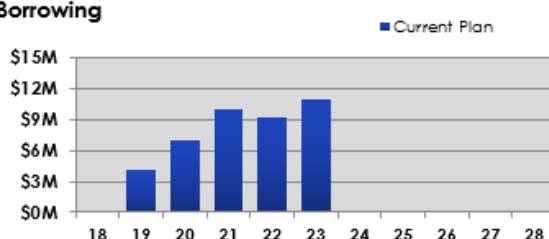
CIP Spending



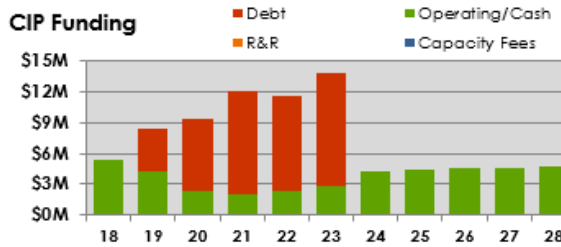
Capital Fund Balance



Borrowing



CIP Funding



Scenario 3: "Levelized" Adjustments

Sewer System

CALC LAST2
SAVE OVR2
CTRL

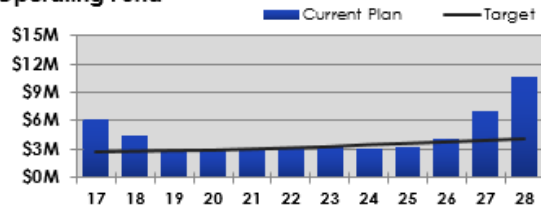
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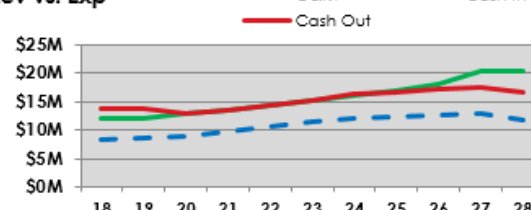
Level rate increases

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2022	FY 2027
Sewer Rate Plan	0.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	21.66%	55.02%
Backup Surcharge	0.00%	-33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
Senior-Lien DSC	1.98	2.08	2.08	1.96	1.83	1.70	1.69	1.81	1.94	2.07	2.86		
Avg Bill (9 CCF)	\$35.95	\$37.57	\$39.45	\$41.45	\$43.48	\$45.62	\$47.88	\$50.24	\$52.73	\$55.34	\$58.07		
Change \$		\$1.62	\$1.88	\$2.00	\$2.03	\$2.14	\$2.26	\$2.36	\$2.49	\$2.61	\$2.73	Check	-

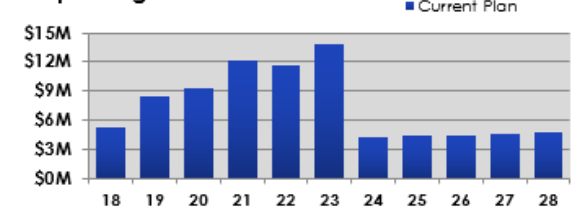
Operating Fund



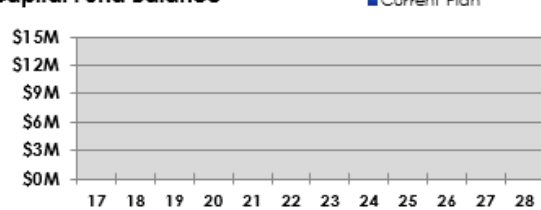
Rev vs. Exp



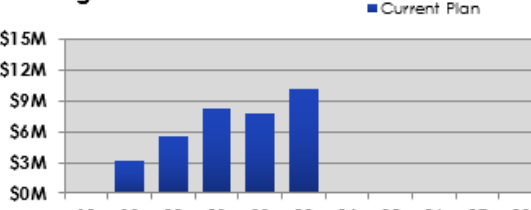
CIP Spending



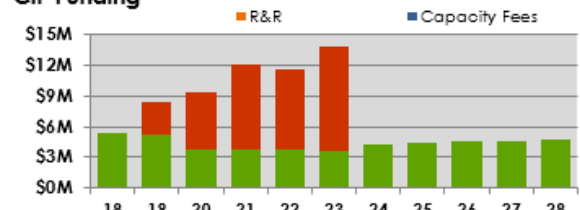
Capital Fund Balance



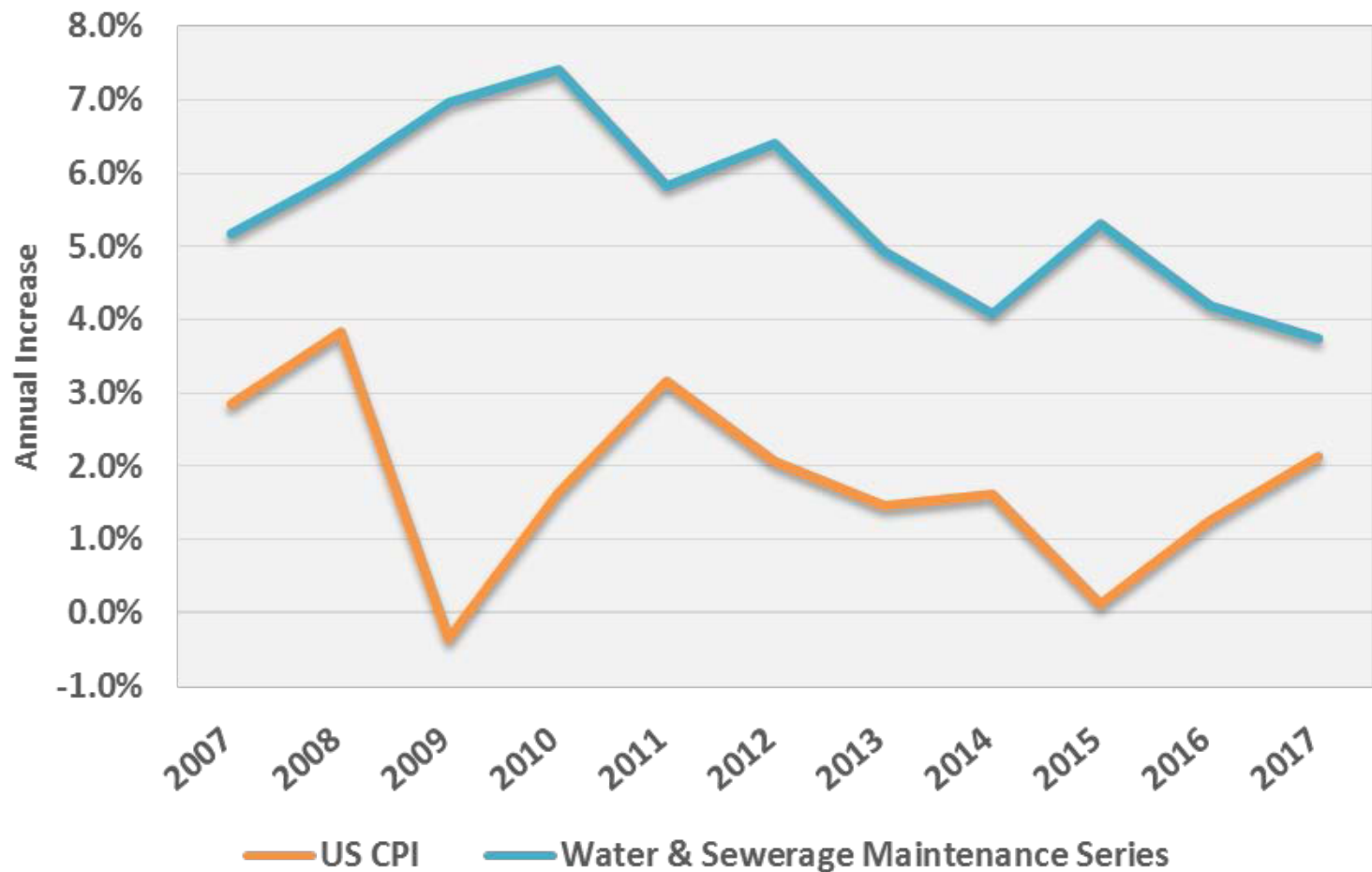
Borrowing



CIP Funding



Overall CPI vs. Water/Sewerage CPI



Stormwater Utility System Overview



Stormwater System

153

Miles of conveyance

\$50M

Net asset value

46 Yrs

Remaining asset life

21K

Active accounts

\$2M

5-year CIP

Current Resources (Fund Balance)

Reserve Summary

Reserve Type			Description
Emergency Capital	\$	250,000	Average replacement cost of storm collection asset
Emergency Capital Equipment	\$	100,000	Cost of replacing key piece of equipment
General Contingency	\$	81,902	5% of expenses (contingency & assessment volatility)
Liquidity	\$	201,949	45 days of operating expenses
		Amount	Months
Number of Months Required	\$	633,851	5
Number of Months Today	\$	3,243,283	24
Available for Future Expenses	\$	2,609,432	

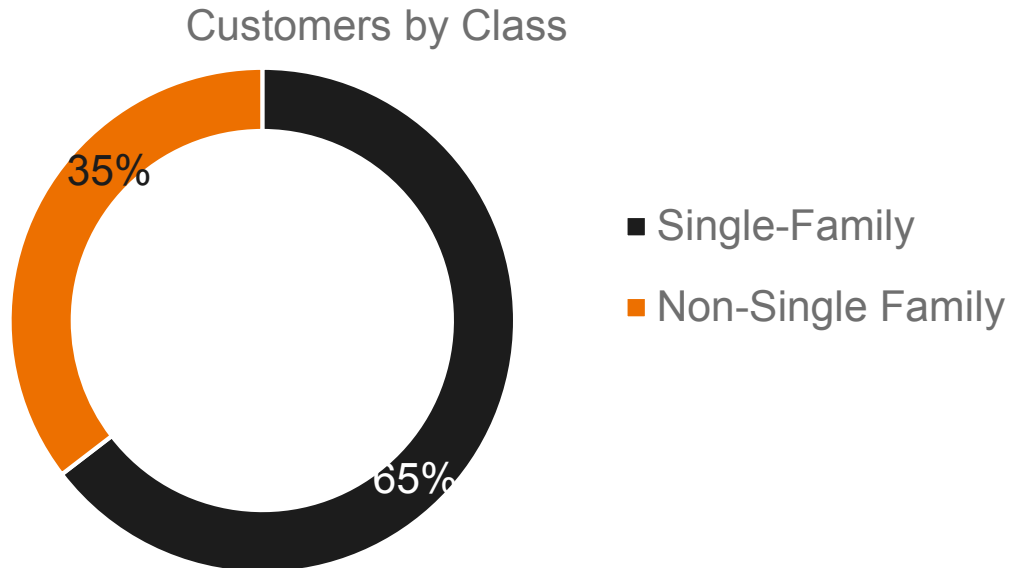
Customer Statistics

Customers	Single-Family
<8,000 ASF ⁽¹⁾	9,023
8,000-16,000 ASF	10,515
>16,000 ASF	1,299
Total	20,837

(1) ASF = Assessed Square Footage

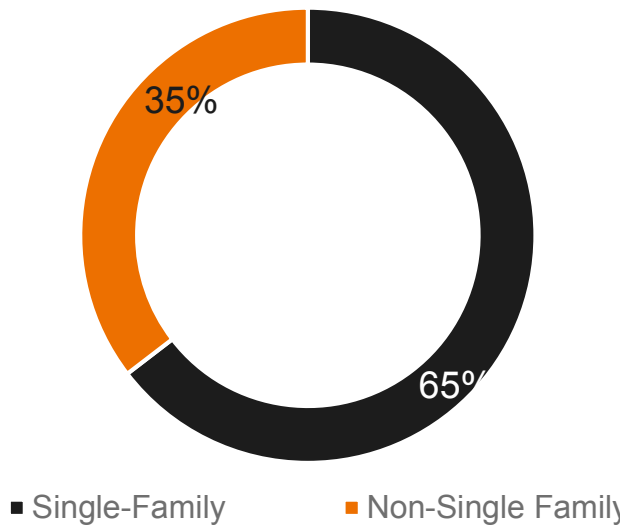
Sq. Ft. ⁽¹⁾	Non-Single Family
Total	117,637

(1) Impervious Sq. Ft. based on FY 18 YTD revenues and non-single family stormwater rates.

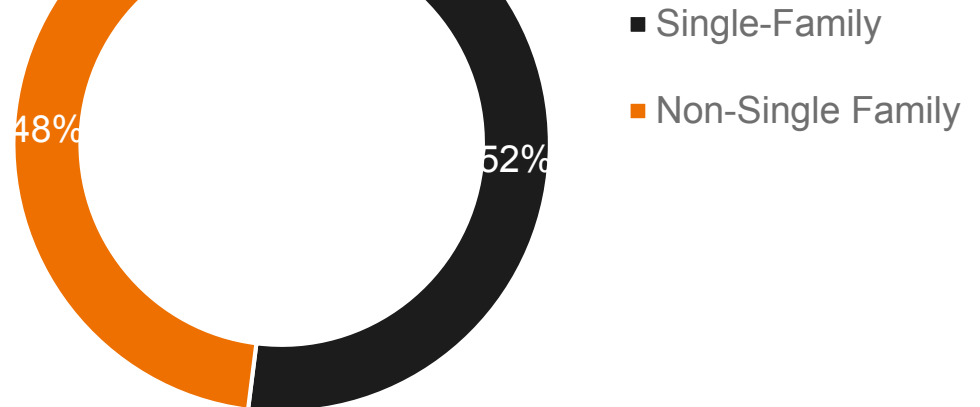


Revenue by Customer Type

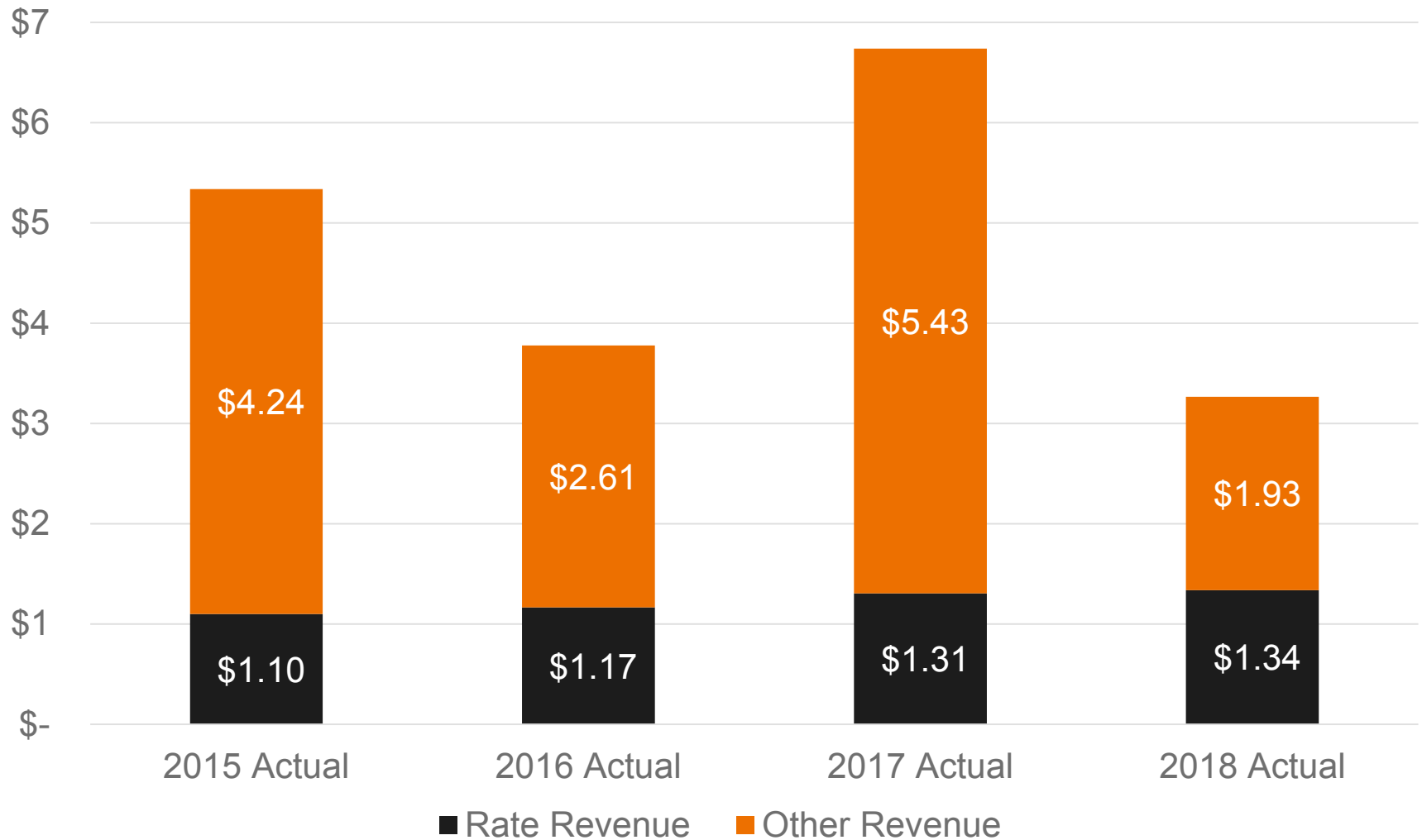
Customers



Projected 2018 Revenue by Customer



Total Annual Revenue (\$ in Millions)

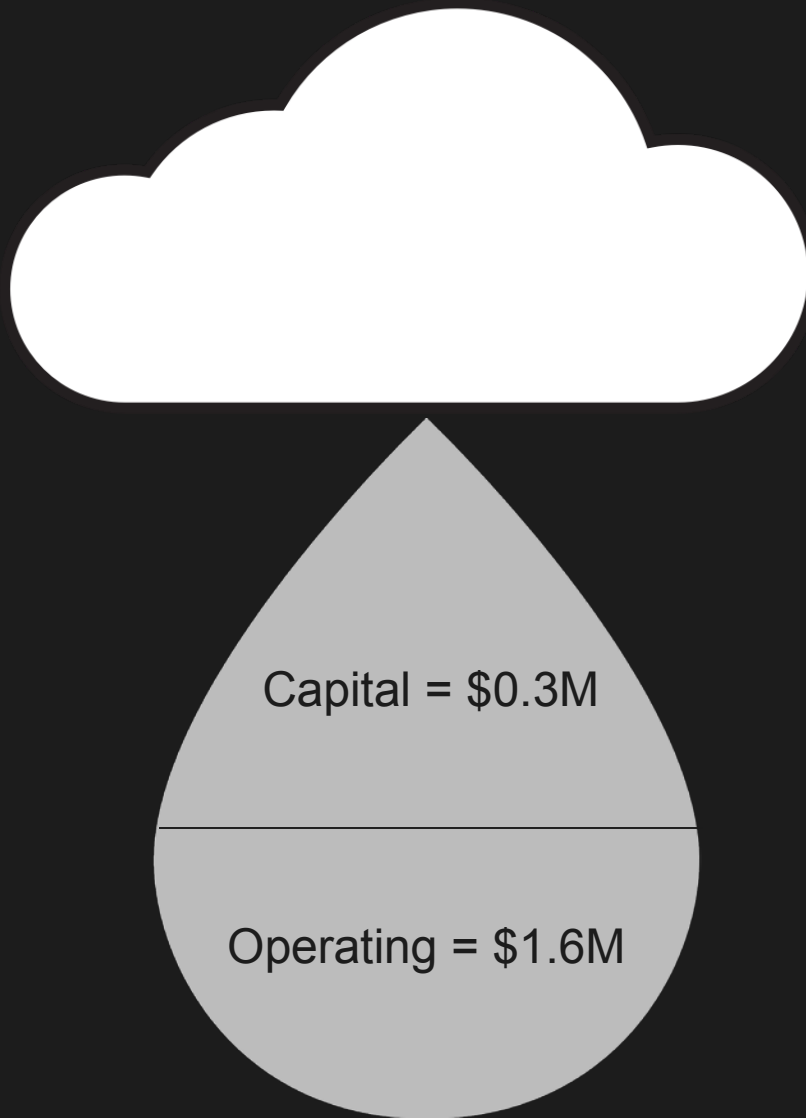


Total Annual Expenditures (\$ in Millions)



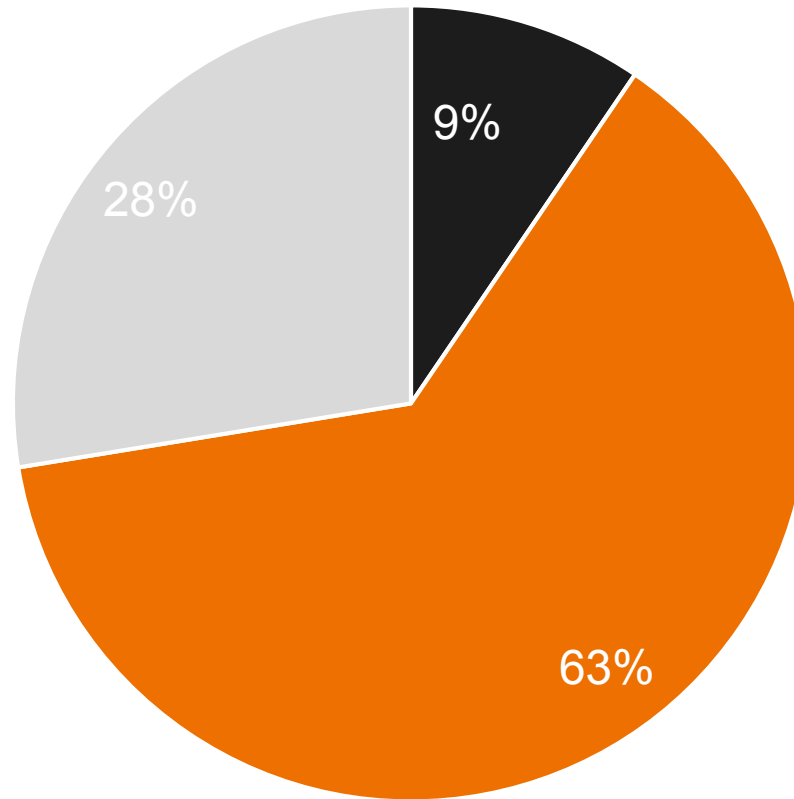


THE COST TO REMOVE THE RAIN



*Represents current
projections for FY 2019*

10-Year Capital Spending Distribution



■ Capital Outlay ■ Storm Sewer Improvements ■ Master Plans

Scenario 1: Status Quo – Do Nothing

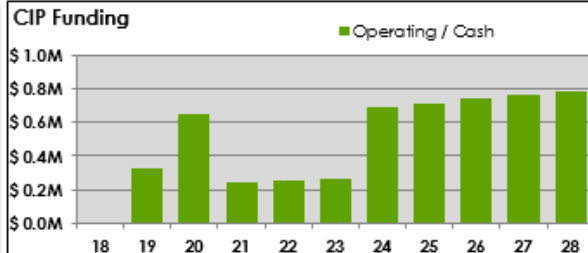
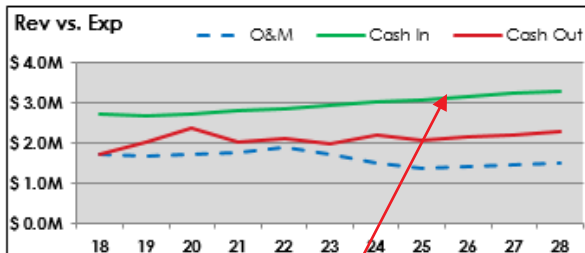
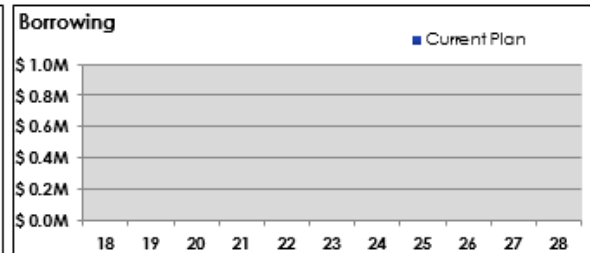
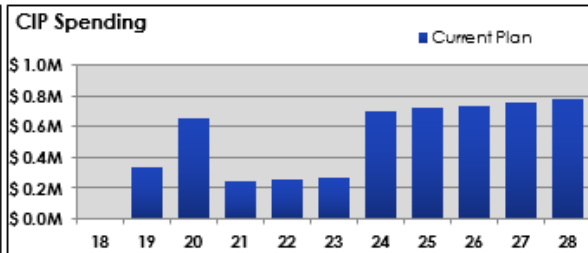
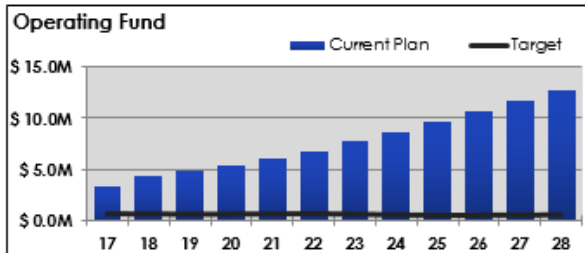
Stormwater
System

No future rate increases

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	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2023	FY 2028
Stormwater Fee Rate Plan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Surcharge Rate Plan	0.00%	0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Monthly Charge	\$4.65	\$4.65	\$4.65	\$4.65	\$4.65	\$4.65	\$4.65	\$4.65	\$4.65	\$4.65	\$4.65		
Change \$		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	Check	-



Revenues exceed expenses

Scenario 2: Remove Surcharge

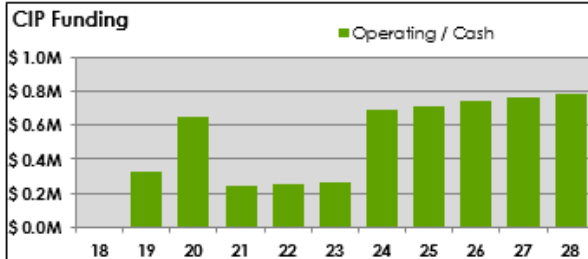
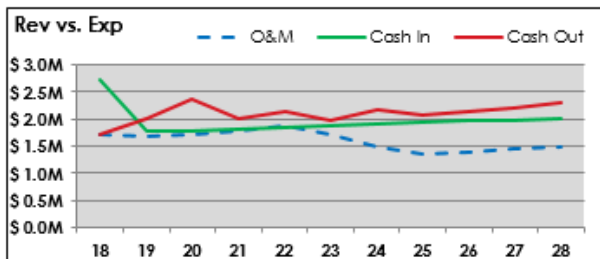
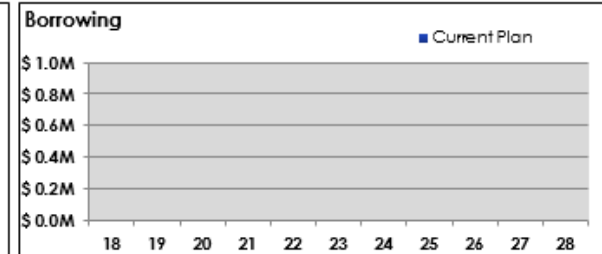
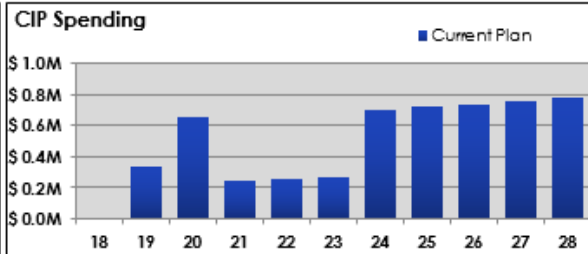
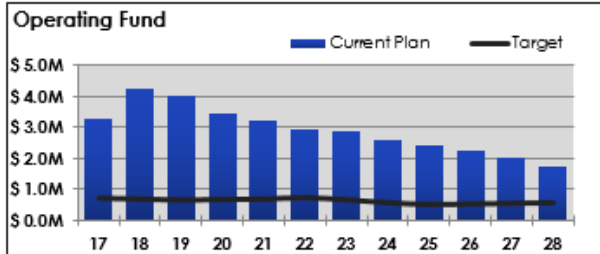
CALC
SAVE

Remove unannexed surcharge

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	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2023	FY 2028
Stormwater Fee Rate Plan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Surcharge Rate Plan	0.00%	-100%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-100.00%	
Monthly Charge	\$4.65	\$2.70	\$2.70	\$2.70	\$2.70	\$2.70	\$2.70	\$2.70	\$2.70	\$2.70	\$2.70		
Change \$		(\$1.95)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	Check	-



Bringing it Together & Remaining Schedule

Typical Residential Utility Bill Comparison

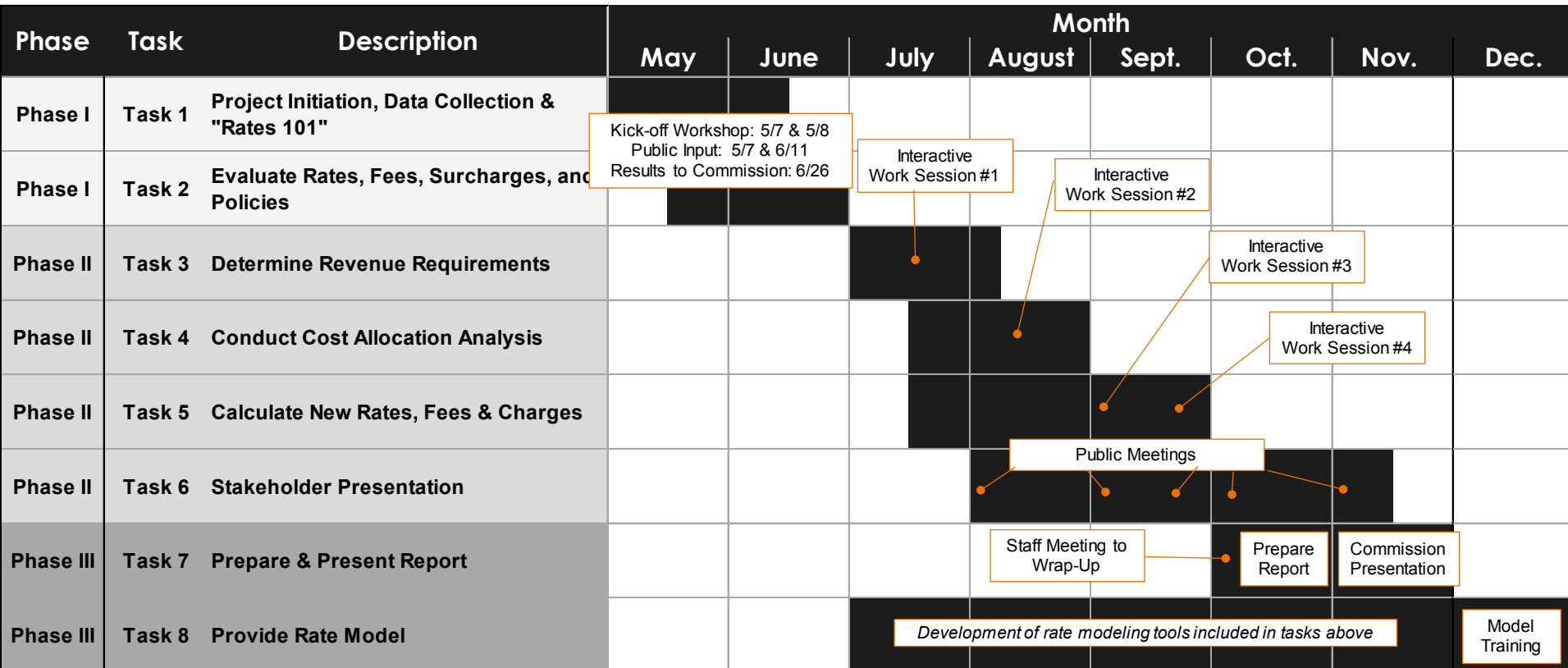
(Based on a 5/8" meter & 9 CCF of monthly water use)

Service	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23
Water	31.65	34.03	35.24	36.49	37.77	39.19
Sewer	\$35.95	\$37.57	\$39.45	\$41.45	\$43.48	\$45.62
Stormwater	\$4.65	\$2.70	\$2.70	\$2.70	\$2.70	\$2.70
Total	\$72.25	\$74.30	\$77.39	\$80.64	\$83.95	\$87.51
\$ Change	N/A	\$2.05	\$3.09	\$3.25	\$3.31	\$3.56
% Change	N/A	2.84%	4.16%	4.20%	4.10%	4.24%

Consider these indicative results! Final rates will vary based upon data updates and completion of additional analysis.

Full schedule and remaining activities

Project Timeline



Takeaway: we have a LOT to do in a very compressed time period

Additional Questions and Answers